Service Manual

FOR THE TURBOCHEF i3™ RAPID COOK OVEN

© 2009-2010 TurboChef Technologies, Inc.

For further information, call
1-800-90TURBO
or
+1 214-379-6000

The information contained in this manual is important for the proper installation, use, maintenance, and repair of this oven. Follow these procedures and instructions to help ensure satisfactory baking results and years of trouble-free service.

Errors – descriptive, typographic, or pictorial – are subject to correction. Specifications are subject to change without notice.

Please carefully read this manual and retain it for future reference.

©2009-2010 TurboChef Technologies, Inc.

Table of Contents

Important Safety Instructions

General Safety Information i
Reducing Fire Risk i
Grounding Instructions ii
Power Cord Replacement ii
Precautions to be Observed Before and During Servicing to Avoid Possible Exposure to Excessive Microwave Energy ii
RF Interference Considerations ii

Specifications and Installation

Theory of Operation 1
Certifications 1
Dimensions 1
Oven Construction 1
Electrical Specifications 2
Unpacking Instructions 3
Lifting and Placing the Oven 3
Installation Near Open Heat Source 4
Optional Installation Items 4
Voltage Selection 4
Ventilation Requirements 4

Daily Maintenance 7

Oven Controls and Cooking

Oven Controls 9
Cooking 10
- Step 1: Turn the Oven On 10
- Step 2: Select Cook Temperature 10
- Step 3: Warming Up 10
- Step 4: Soaking 11
- Step 5: Ready to Cook or “Idle” 11
- Step 6: Adjusting the Time 11
- Step 7: Cooking 11
- Step 8: Remove Food from Oven 12
- Step 9: Additional Cooking Options 12
- Step 10: Cooling Down 12

Info Mode

Overview of the Info Mode 13
Viewing Cook Counter/Time Logs 13
Viewing the Fault Log 13
Viewing the Service Numbers 14

Options Screen 14
Setting the Language 14
Setting the Date/Time 14
Adjusting the Volume 15
Setting the F2 Alarm 15
Making a Copy of the Oven Menu 15
Updating the Oven Menu 15
Updating the Oven Firmware 15
Resetting the Oven 15
Test Mode - Testing Oven Parts 16
- Top and Bottom Blower 16
- Heaters 16
- Magnetron Test 16
- Stirrer 16

Status Indicators 16
Fault Log 16
Turning Diagnostic Mode On/Off 16
Manufacturing Mode 17
- Microwave Leakage Test 17
- Microwave Power Test 17
- Burn-In 17
- Serial Number Edit 17
- Changing Temperature Measurement Setting 17
- Self Test 17
- Volt On 18
- Erase/Default Oven Settings 18

Edit Mode

Overview of the Edit Mode 19
Changing Set Temperatures 19
Changing Food Group/Item Name 20
Changing Recipe Settings 20

Oven Systems

Convection System 21
- Blower Motor (Bottom) 21
- Blower Motor (Top) 21
- Blower Motor Speed Controller (BMSC) 21
- Heater Elements 21
- Jetplate (Bottom) 21
- Jetplate (Top) 21
- Top Jetplate Insert 21
- Stirrer Motor and Assembly 22

Convection System Troubleshooting 22
Oven Door 22
Removing/Reinstalling the Oven Door 22
Adjusting the Oven Door 22
Interlock Switches 24
Adjusting the Door Switches 24
Hinges and Counter-Balance Assembly 24
Adjusting the Counter-Balance Assembly 24
Measuring RF Leakage for Microwave Safety 25
Oven Door Troubleshooting 26
Microwave System 27
Capacitors 27
Testing a Capacitor 27
Filament Transformers 27
Wiring the Filament Transformers 27
High-Voltage Transformers 28
Wiring the High-Voltage Transformers 28
Testing a Filament or High-Voltage Transformer 28
High-Voltage Diodes 28
Testing a High-Voltage Diode 29
Magnetrons 30
Testing a Magnetron for an Open/Shorted Filament 30
Stirrer Motor and Assembly 30
Wave Guides 30
Microwave System Troubleshooting 30
Control System 31
Control Board 31
Display 31
Electrical Compartment Cooling Fans 31
Electrical Compartment Cooling Fan Thermostat 31
Electrical Compartment Thermocouple 31
EMI Filter 31
Fuses 31
High-Limit Thermostat 32
Keypad 32
Magnetron Cooling Fan 32
Magnetron Thermostats 32
Power Supply 32
Relay - K1 Filament 32
Relay - K2 Anode 32
Relay - K3 Monitor 32
Relay - K6 Voltage 32
Relay - K7 Magnetron Cooling Fan 33
Relay - K8 Stirrer Motor 33

RTD 33
Smart Card Reader 33
Solid State Relay - K4/K5 Heater 33
Speaker 33
USB Port 33
Wire Harness 33
Voltage Sensor 34
Control System Troubleshooting 34
Filtering System 34
Catalytic Converter 34
Drain Pan 34
Air Filter 34
Vent Catalyst 34
Filtering System Troubleshooting 34

Troubleshooting

Overview of Troubleshooting 35
Fault Code Descriptions 35
Fault Code Troubleshooting - F1 Blower Running Status Bad 37
Fault Code Troubleshooting - F2 Cook Temperature Low 38
Fault Code Troubleshooting - F3 Magnetron Current Low 39
Fault Code Troubleshooting - F4 Door Monitor Defective 40
Fault Code Troubleshooting - F5 Magnetron Over Temperature 40
Fault Code Troubleshooting - F6 Electrical Compartment Temperature High 41
Fault Code Troubleshooting - F7 Open RTD 41
Fault Code Troubleshooting - F8 Heat Low 42
Fault Code Troubleshooting - F9 Cook Cavity Temperature High 42
Non-Fault Code Troubleshooting - No Keypad Input 43
Non-Fault Code Troubleshooting - “Cook Door Open” Message when Door is Closed 43
Non-Fault Code Troubleshooting - No Display (Screen is Blank) 44
Non-Fault Code Troubleshooting - Food Not Cooking Properly 45
Non-Fault Code Troubleshooting - “Read Fail” Message when Loading a Menu 46
Non-Fault Code Troubleshooting - “Write Fail” Message when Loading a Menu 47
Non-Fault Code Troubleshooting - “Defective Media” Message When Oven is Plugged in or Restarted 48

Oven Schematic

49

Appendix - Replacing Oven Components

Replacing Oven Components A-1
No Cover Removal Required A-2
Opening Top Cover Required A-4
Removing Top Cover Required A-5
Removing Left Side Cover Required A-8
Removing Right Side Cover Required A-10
Removing Right and Left Covers Required A-11

IMPORTANT SAFETY INSTRUCTIONS

WARNING: When operating this oven, strictly adhere to the following safety precautions to reduce the risk of burns, electric shock, fire, injury, damage to oven or property near oven, or possible exposure to excessive microwave energy.

General Safety Information

- ✓ Read all instructions before using this appliance.
- ✓ Read and follow the specific "Precautions to be Observed Before and During Servicing to Avoid Possible Exposure to Excessive Microwave Energy" found on page ii.
- ✓ This appliance must be grounded. Connect only to properly grounded outlet. See "Grounding Instructions" found on page ii.
- ✓ Install or locate this appliance only in accordance with the provided installation instructions.
- ✓ Some products such as whole eggs and sealed containers (e.g., closed glass jars) may explode and should not be heated in this oven.
- ✓ Use this appliance only for its intended uses as described in this manual.
- ✓ This appliance should be serviced only by qualified service personnel. Contact the nearest authorized service facility for examination, repair, or adjustment.
- ✓ Keep cord away from heated surfaces.
- ✓ Liquids, such as water, coffee, or tea are able to be overheated beyond the boiling point without appearing to be boiling. Visible bubbling or boiling when the container is removed from the microwave oven is not always present. THIS COULD RESULT IN VERY HOT LIQUIDS SUDDENLY BOILING OVER WHEN THE CONTAINER IS DISTURBED OR A UTENSIL IS INSERTED INTO THE LIQUID.
- x DO NOT allow children to use this appliance.
- x DO NOT use corrosive chemicals or vapors in this appliance - it is not designed for industrial or laboratory use.
- x DO NOT operate this appliance if it has a damaged cord or plug, is not working properly, or has been damaged or dropped. See Power Cord Replacement found on page ii.
- x DO NOT cover or block any openings on this appliance.
- x DO NOT store this appliance outdoors.
- x DO NOT use this product near water (e.g., near a kitchen sink, in a wet basement, near a swimming pool).
- x DO NOT immerse cord or plug in water.
- x DO NOT let cord hang over the edge of table or counter.
- x DO NOT use a water jet for cleaning. See the Maintenance section (pages 7-8) for proper cleaning procedures.

Reducing Fire Risk

- ✓ Remove wire twist-ties from paper or plastic bags used to facilitate cooking in the oven.
- ✓ If materials inside the oven ignite, keep the oven door closed, turn the oven off, and disconnect the power cord or shut off power at the fuse or circuit breaker panel.
- ✓ If smoke is observed, switch off or unplug the oven. Keep the door closed to stifle any flames.
- x DO NOT use the cook cavity for storage purposes.
- x DO NOT overcook food. Carefully attend to the oven if paper, plastic, or other combustible materials are placed inside the oven to facilitate cooking.
- x DO NOT leave paper products, cooking utensils, or food in the cavity when not in use.

SAVE THESE INSTRUCTIONS

Grounding Instructions

This appliance must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This oven is equipped with a cord that has a grounding wire with a grounding plug, which must be plugged into an outlet that is properly installed and grounded. Consult a qualified electrician or serviceman if uncertain about the ability to follow grounding instructions or if doubt exists as to whether the appliance is properly grounded.

- x DO NOT use an extension cord. If the power cord is too short, have a qualified electrician or serviceman install an outlet near the appliance.

⚠ WARNING: Improper grounding can result in risk of electric shock.

Power Cord Replacement

If the power cord is damaged, it must only be replaced by the manufacturer, its service agent, or a similarly-qualified person.

Precautions to be Observed Before and During Servicing to Avoid Possible Exposure to Excessive Microwave Energy

(a) DO NOT operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary: (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

Refer to pages 25-26 for leakage test procedures.

RF Interference Considerations

The i3 oven generates radio frequency signals. This device has been tested and was determined to be in compliance with applicable portions of FCC part 18 requirements and to the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility at the time of manufacture. However, some equipment with sensitivity to signals below these limits may experience interference.

If your equipment experiences interference:

- ✔ Increase the physical separation between this oven and the sensitive equipment.
- ✔ If the sensitive device can be grounded, do so following accepted grounding practices.
- ✔ If battery-powered microphones are being affected, ensure that the batteries are fully charged.
- ✔ Keep sensitive equipment on separate electrical circuits if possible.
- ✔ Route intercom wires, microphone wires, speaker cables, etc. away from the oven.

Specifications and Installation

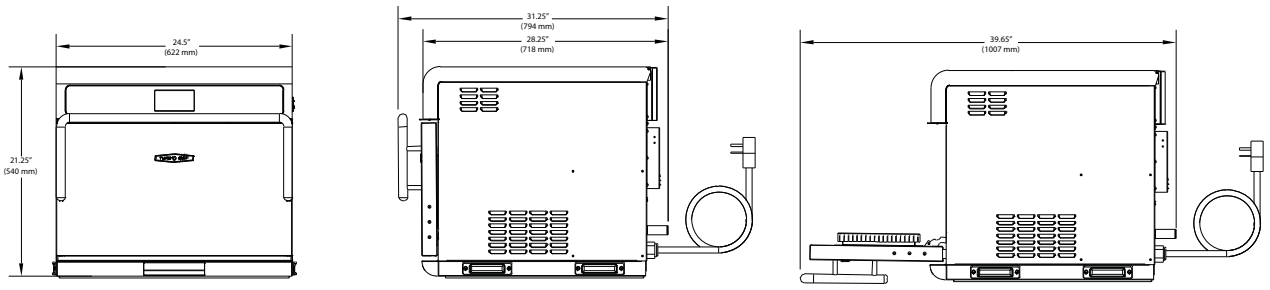


Figure 1: i3 Oven Dimensions

Theory of Operation

Utilizing TurboChef's patented technology to rapidly cook food without compromising quality, the i3 oven provides superior cooking performance while requiring minimal space and energy consumption. The control system precisely coordinates independent top and bottom impinged airflow with microwave to deliver superior quality and throughput. The top-launched microwave system allows for use of most standard metal pans, and integral catalytic converters allow for UL®-certified ventless operation (see page 4 for details and limitations).

This manual includes instructions for servicing, troubleshooting, installing, cleaning, and operating the i3 oven. If you have questions that are not addressed in this manual, contact Technical Service (800.90TURBO, +1 214-379-6000) or your Authorized Distributor.

Certifications

cULus, UL EPH, TÜV, CE, FDA

ANSI/NSF #4
81Y5

UL 710B (KNLZ) listed for ventless operation.

Dimensions

Oven Dimensions
Height: 21.25" (540 mm)
Width: 24.5" (622 mm)
Depth (footprint): 25.75" (654 mm)
Depth (door closed): 31.25" (794 mm)
Depth (door open): 39.65" (1007 mm)
Weight: 245 lb. (111 kg)

Cook Cavity Dimensions
Height: 6.9" (175 mm)
Width: 19.4" (493 mm)
Depth: 14.75" (375 mm)
Volume: 1.14 ft^3 (32.3 liters)

Clearances
Top: 19" (483 mm)
Sides: 2" (51 mm)

Oven Construction

Exterior
- Two-tone stainless steel front, top, and sides
- 304 stainless steel removable grease pan
- Ergonomic door handle
- Rubber seal for surface mounting
- Side hand grips for lifting

Interior
- 304 stainless steel interior
- Fully-insulated cook chamber
- Oven rack removable for cleaning
- Top and bottom jetplates

Electrical Specifications

TurboChef recommends a Type D circuit breaker for all installations outside the US.

Single Phase

i3 US model (i3-9500-1)*
208/240 VAC, 60 Hz, 40 amps
Max Input: 8300/9600 watts
Plug: NEMA 6-50P, 8/3

i3 BK model (i3-9500-6-BK)
220 VAC, 60 Hz, 40 amps
Max Input: 8800 watts
Plug: IEC 309, 3-pin

i3 LA model (i3-9500-7-LA)
220 VAC, 60 Hz, 40 amps
Max Input: 8800 watts
Plug: NEMA 6-50P

i3 UK model (i3-9500-2-UK)
230 VAC, 50 Hz, 40 amps
Max Input: 9200 watts
Plug: IEC 309, 3-pin

i3 JK model (i3-9500-8-JK) - 50 Hz
(i3-9500-10-JK) - 60 Hz
200 VAC, 50 or 60 Hz, 40 amps
Max Input: 8000 watts
Plug: PSE-marked, 3-blade

Multi Phase

i3 DL (USA) model (i3-9500-14-DL)*
208/240 VAC, 60 Hz, 24 amps
Max Input: 8600/9900 watts
Plug: NEMA 15-30P

i3 BD model (i3-9500-16-BD)
220 VAC, 60 Hz, 24 amps
Max Input: 9100 watts
Plug: IEC 309, 4-pin

i3 LD model (i3-9500-15-LD)
220 VAC, 60 Hz, 24 amps
Max Input: 9100 watts
Plug: NEMA 15-30P

i3 EW model (i3-9500-4-EW)
400 VAC, 50 Hz, 14 amps
Max Input: 9500 watts
Plug: IEC 309, 5-pin

i3 AU model (i3-9500-5-AU)
400 VAC, 50 Hz, 14 amps
Max Input: 9500 watts
Plug: Clipsal 5-pin

i3 KW model (i3-9500-12-KW)
400 VAC, 60 Hz, 14 amps
Max Input: 9500 watts
Plug: IEC 309, 5-pin

i3 ED model (i3-9500-3-ED)
230 VAC, 50 Hz, 24 amps
Max Input: 9500 watts
Plug: IEC 309, 4-pin

i3 SD model (i3-9500-13-SD)
230 VAC, 60 Hz, 24 amps
Max Input: 9200 watts
Plug: IEC 309, 4-pin

i3 JD model (i3-9500-9-JD) - 50 Hz
(i3-9500-11-JD) - 60 Hz
200 VAC, 50 or 60 Hz, 23 amps
Max Input: 8000 watts
Plug: PSE-marked, 4-blade

* North America models include a voltage sensor that detects 208 or 240 VAC. The voltage sensor does not compensate for lack-of or over-voltage installations.

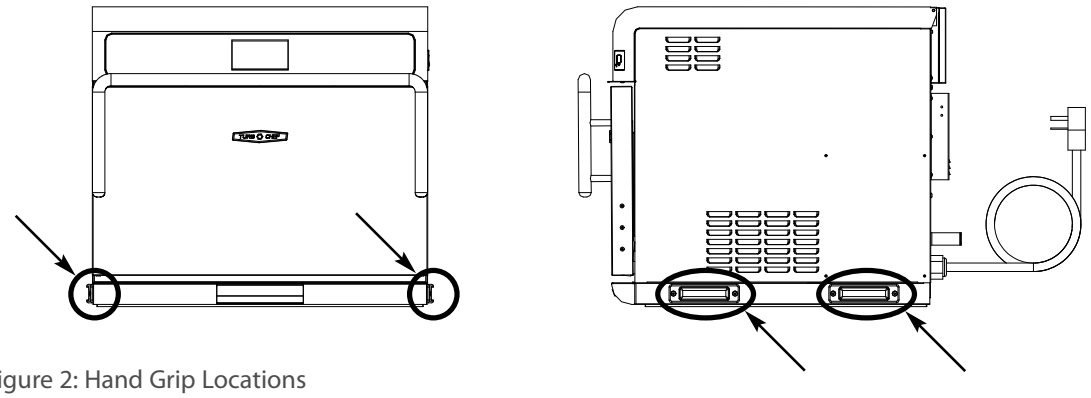


Figure 2: Hand Grip Locations

⚠ Install or locate this appliance only in accordance with the instructions below.

Unpacking Instructions

1. Remove oven from packaging.
2. Before discarding packaging, check thoroughly for accessories, consumables, and literature.
3. Discard packaging.
4. Check cook cavity thoroughly for accessories, consumables, and literature.
5. Discard any packaging in cook cavity.

Lifting and Placing the Oven

⚠ WARNING: Oven weighs approximately 245 lb. (111 kg). Never lift with fewer than two people.

⚠ WARNING: Lift the oven only by using the provided hand grips. Never lift the oven by the door handle.

⚠ WARNING: The oven must be properly placed on a table or countertop at all times. TurboChef will not recognize a fallen oven as a warrantable claim and is not liable for any injuries that may result.

⚠ WARNING: This oven is not intended for built-in installation (i.e., installing the oven in any structure that surrounds the oven by five or more sides). Be sure to provide a minimum of 2" (51 mm) clearance for all sides and 19" (483 mm) clearance for the top.

1. Prepare a surface that is at least 30" (762 mm) deep and capable of supporting 250 lb. (113 kg). If installing onto an oven cart, make sure the wheels/casters are locked.
2. Position one or more persons at the front and rear of the oven.
3. Place hands into grips (see Figure 2) and lift.
4. Place the oven on the prepared surface or cart, ensuring no edges are hanging off the sides.
5. Install the oven rack.
6. Plug in the oven.

NOTE: The oven is primarily serviced through its top. DO NOT install shelving directly over the unit. The operator will be responsible for service charges incurred as a result of added time required to access the top of the oven.

Installation Near Open Heat Source

See Figure 4, page 5.

When placing a TurboChef oven near an open heat source, strictly adhere to the following:

- If the oven is being placed near a grill or stove, a divider must exist between the oven and the open heat source, with a minimum of 6" (152 mm) between the oven and the divider.
- If the oven is being placed near a fryer, a divider must exist between the oven and fryer, with a minimum of 12" (305 mm) between the oven and the divider.
- The height of the divider must be greater than or equal to the height of the oven (21.25" or 540 mm).
- Verify the oven location has a minimum 19" (483 mm) clearance on top and a minimum 2" (51 mm) of clearance on each side.

Optional Installation Items

See Figure 5, page 5.

TurboChef Oven Cart
- Part Number: NGC-1217-2
- Height: 17.3" (439 mm)
- Width: 27.8" (706 mm)
- Depth: 26.625" (676 mm)

TurboChef Stacking Stand
- Part Number: i5-9369
- Height: 44.6" (1133 mm)
- Width: 32.5" (826 mm)
- Depth: 26.5" (673 mm)

Oven Restraint Kit
Part Number: TC3-0242

⚠ WARNING: The Oven Restraint Kit will not prevent the oven from falling off a countertop if the oven is pulled off or allowed to slide off the edge. Installation instructions are included with the kit.

ChefComm Pro (CON-7006)

ChefComm Pro empowers any user of a TurboChef oven to easily and efficiently create menu settings on a computer and transfer them to an oven via smart card or USB device.

ChefComm Limited (CON-7016)

ChefComm Limited is a "read-and-transfer only" version of ChefComm Pro that helps ensure carefully-crafted settings are easy to distribute globally, while providing the peace of mind that they will not be altered.

Voltage Selection

For North America oven models, the oven will detect 208 or 240 incoming voltage.

The initial voltage selection is typically completed before the oven is used by the customer. However, if incoming voltage for the store is different than the preset voltage, the operator will be required to select either 208 or 240 after pressing the On/Off key to turn on the oven. The correct voltage will be enlarged on the screen, identifying which option to select (see Figure 3 below).

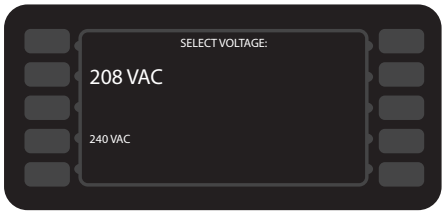


Figure 3: Selecting Voltage

Ventilation Requirements

The TurboChef model i3 oven has been approved by Underwriter's Laboratory for ventless operation (UL 710B, KNLZ listing) for all food items except for foods classified as "fatty raw proteins." Such foods include bone-in, skin-on chicken, raw hamburger meat, raw bacon, raw sausage, steaks, etc. If cooking these types of foods, consult local HVAC codes and authorities to ensure compliance with ventilation requirements.

NOTE: In no event shall the manufacturer assume any liability for damages or injuries resulting from installations which are not in compliance with the instructions and codes previously listed.

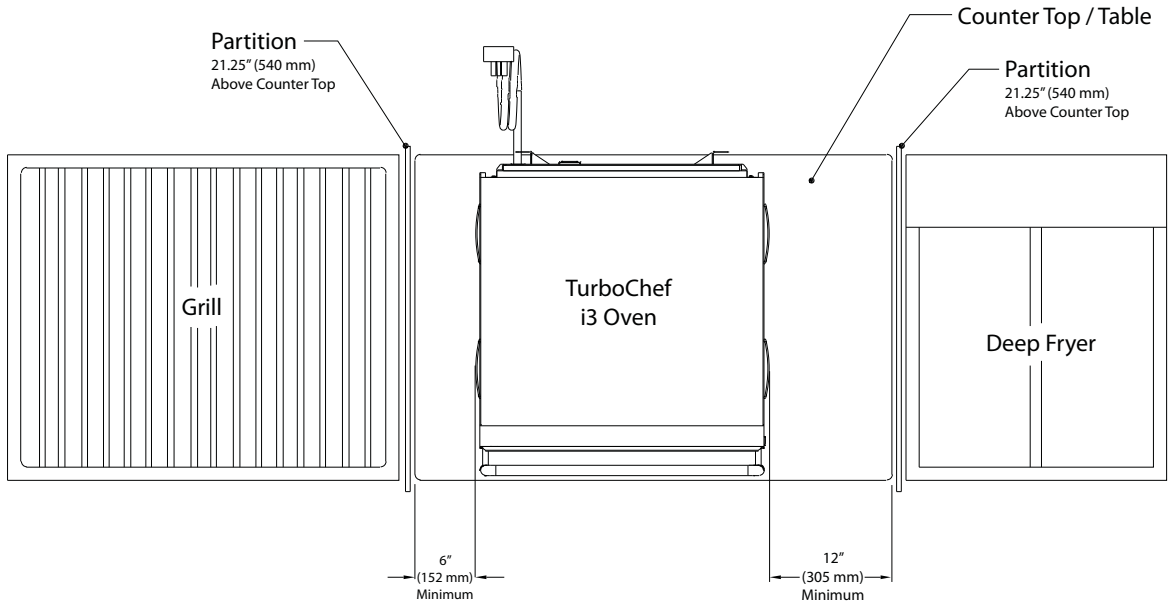


Figure 4: Installation Near Open Heat Source

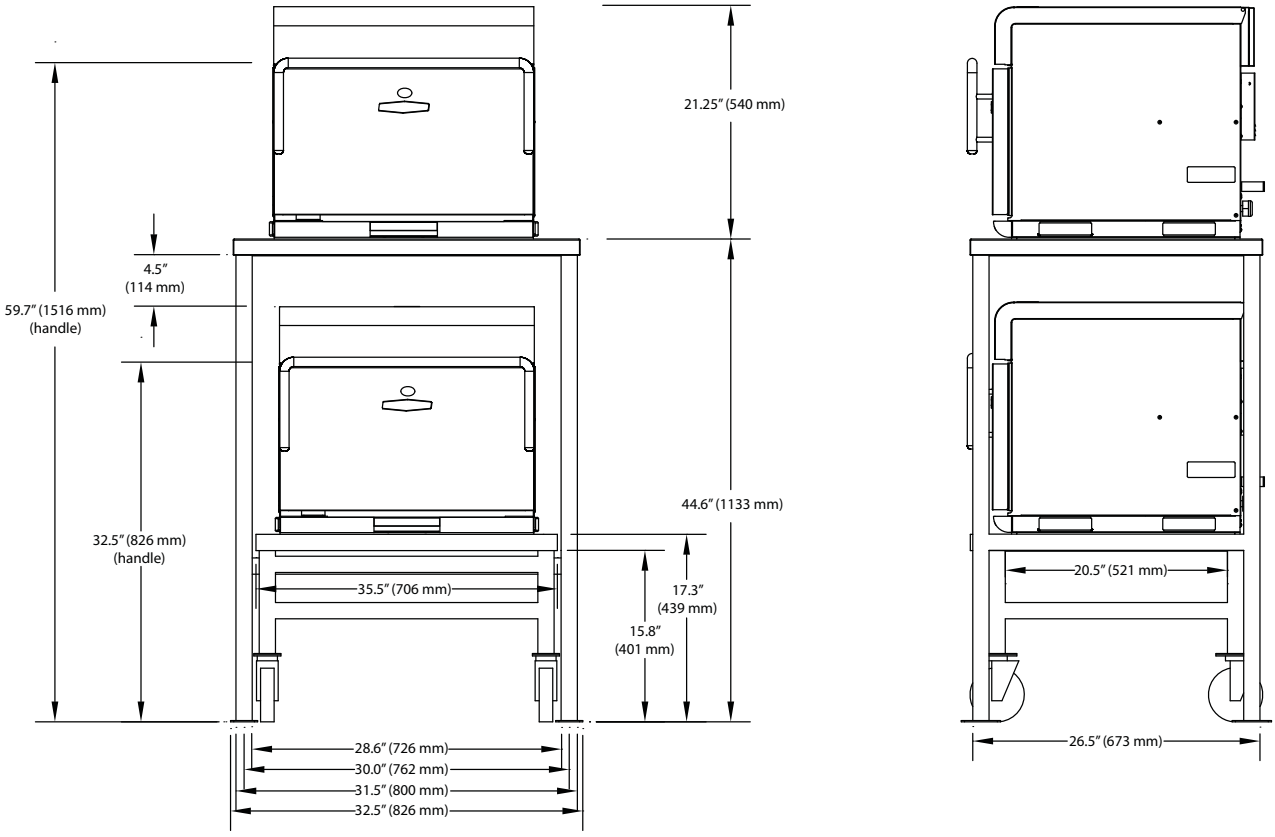


Figure 5: Oven Cart and Stacking Stand Dimensions

This page intentionally left blank.

Daily Maintenance

Daily Maintenance

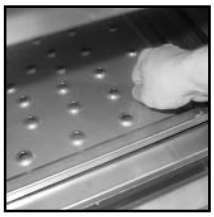
The following steps will help maintain your i3 oven. Use only TurboChef Oven Cleaner and Oven Guard. The use of any other cleaning products can damage critical oven components, which will result in a non-warranty service call.

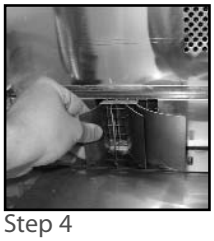
Supplies and Equipment

- Oven Cleaner (Part Number: 103180)
- Oven Guard (Part Number: 103181)
- Nylon scrub pad, cleaning towel, disposable gloves, protective eyewear, dust mask (optional), *pair of tongs wrapped with towel (optional - see step 11)

Step 1

Step 2


Step 3


Step 4

Step 5

Step 6

Step 1: Prepare the Oven

⚠ WARNING: The oven operates at approximately 500°F (260°C) and may cause injury if not allowed to cool properly.

- Turn off the oven by pressing the On/Off key.
- Slightly open the oven door. Cooling takes approximately 40 minutes.
- DO NOT attempt to clean the oven until the oven displays “Oven Off.”

Step 2: Remove and Clean the Wire Rack

⚠ WARNING: Be sure the oven interior is cool before you remove the wire rack.

- Wash, rinse, sanitize, and dry the wire rack.

Step 3: Remove and Clean the Lower Jetplate

- Unscrew the two thumb screws on the lower jetplate.
- Lift the lower jetplate by gripping the thumb screws.
- Remove the lower jetplate.
- Wash, rinse, sanitize, and dry the lower jetplate.

Step 4: Remove and Clean the Lower Air Diverter

- Remove the lower air diverter.
- Wash, rinse, sanitize, and dry the lower air diverter.

⚠ WARNING: DO NOT discard the lower air diverter. The oven will not work without the lower air diverter installed.

Step 5: Wipe the Oven Interior

- Wipe any large particles from the oven interior with a damp towel.

Step 6: Clean the Oven Interior

- Spray oven cleaner onto the top, bottom, and sides of the oven interior.

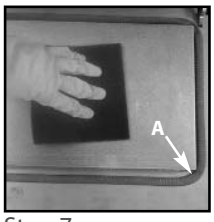
⚠ CAUTION: DO NOT spray oven cleaner into the holes on the back oven wall. Doing so can damage critical oven components, resulting in a non-warranty service call.

- Allow Oven Cleaner to penetrate stains for five minutes.
- Clean the oven interior with a nylon scrub pad.

NOTE: Depending on the model, the oven will utilize either a ceramic top jetplate or a metal top jetplate that incorporates a glass insert.

⚠ CAUTION: DO NOT apply excessive pressure when wiping the top ceramic jetplate or glass insert; breakage will result in a non-warranty service call.

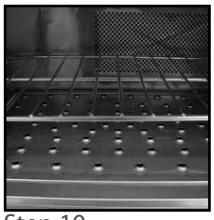
⚠ CAUTION: DO NOT remove the top ceramic jetplate or glass insert; breakage will result in a non-warranty service call.



Step 7

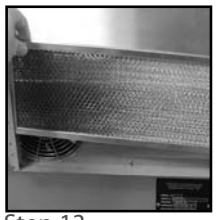
Step 8

Step 9


Step 10

Step 11

Step 12


Step 13

Step 7: Clean and Dry the Oven Door

⚠ CAUTION: DO NOT spray cleaner directly onto the oven door gasket (A) or saturate it with water.

⚠ CAUTION: DO NOT scrub, scrape, or attempt to clean the oven door gasket (A). Doing so may cause the door to not close properly, resulting in a non-warranty service call.

- Clean the oven door with oven cleaner and a nylon scrub pad.
- Wipe the oven door with a damp towel.

Step 8: Rinse the Oven Interior

⚠ CAUTION: DO NOT use a hose or water jet for cleaning. Doing so can damage critical oven components, resulting in a non-warranty service call.

- Rinse the oven interior with clean water.
- Thoroughly dry the oven interior with a clean towel.

Step 9: Apply TurboChef Oven Guard

- Spray Oven Guard onto a clean towel.
- Wipe the oven's interior walls and the inside of the oven door.

⚠ CAUTION: DO NOT apply Oven Guard to the oven door gasket. Doing so may damage the gasket, resulting in a non-warranty service call.

Step 10: Reinstall Components

- Reinstall the lower air diverter.
- Reinstall the lower jetplate. Screw in the two thumb screws to lock the lower jetplate in place.
- Reinstall the wire rack and close the oven door.

Step 11: Clean the Drain Pan

- Remove the lower front panel.
- Remove the drain pan entirely from the bottom of the oven.
- Wipe down* the inside of the area the drain pan fits within.
- Empty, clean, and reinstall the drain pan.
- Reinstall the lower front panel.

Step 12: Clean the Oven Exterior

- Wipe the oven exterior with a clean, damp towel.

⚠ CAUTION: DO NOT spray chemicals into any openings, such as the louvers on the side panels or the rear vent catalyst housing. Doing so can damage critical oven components, resulting in a non-warranty service call.

Step 13: Clean the Air Filter (once per week)

- Remove the air filter from the back panel.
- Gently wash by hand in the sink or rinse with hot water.

⚠ CAUTION: DO NOT use a water jet. Doing so will shorten the life of the filter.

- Reinstall the air filter, or replace it if large holes are present or if the mesh is becoming detached from the frame.

⚠ CAUTION: DO NOT operate the oven without the air filter in place.

Oven Controls and Cooking

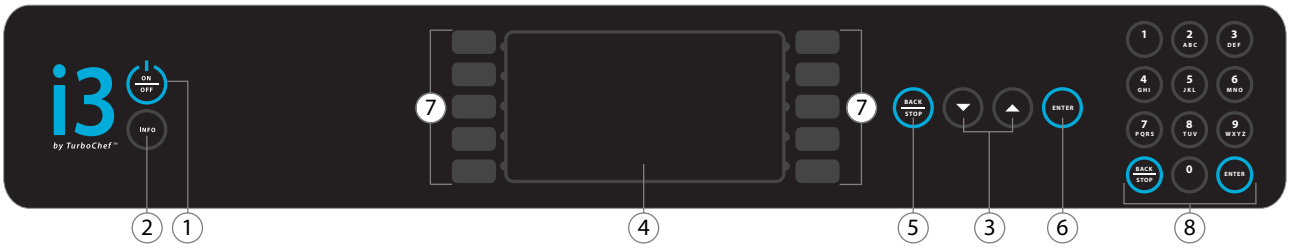


Figure 6: Oven Controls

Oven Controls

1. On/Off Key

Press to turn the oven on (begin warmup) or off (cool down), or to exit Info Mode (page 13).

2. Info Key

When the oven is off or cooling down, press to access the Info Mode (see page 13).

3. Up and Down Keys

When the oven is ready to cook (i.e., warmed up and waiting for a cook command), press the Up or Down key to view additional food groups or items.

When the oven is in the Info Mode (see page 13), press to navigate between screens 1 and 2.

When editing a food item, press to navigate between editable fields (Figure 30, page 20).

4. Display

The display shows information relevant to the current oven operation and/or user options.

5. Back/Stop Key

When the oven is cooking, press the Back/Stop key to immediately terminate a cook cycle. When the oven is ready to cook (i.e., warmed up and waiting for a cook command), or in the Info Mode (see page 11), press the Back/Stop key to return to the previous screen.

6. Enter Key

Press the Enter key when saving changes to food item settings (Figure 30, page 20), or whenever instructed by the oven screen.

7. Soft Keys

There are ten soft keys - five to the left and right of the display. Press a soft key to select an option adjacent to that key on the display.

NOTE: Soft keys are labeled L1-L5 and R1-R5 in this manual (where applicable) for identification purposes.

8. Numeric Keypad

Use the numeric keypad to enter access passwords or modify cook settings (Figure 30, page 20). The numeric keypad also contains a Back/Stop key and an Enter key, which are functionally identical to Items 5 and 6.

Cooking

The oven is preprogrammed with recipe settings at the time of manufacture and is ready to operate out of the box. If these settings are erased, new menu settings must be either loaded via smart card/USB drive (page 15) or programmed manually (pages 19-20). The oven will not cook unless settings are present.

Note that the steps below are not always sequential. Typically, multiple items will be cooked before cooling the oven (Step 10).

Step 1: Turn the Oven On

Figure 7: Oven Off

When the oven is off (Figure 7), the oven temperature has receded below 150°F (66°C), but the display and keypad remain on.

Press the On/Off key to turn the oven on.

Step 2: Select Cook Temperature

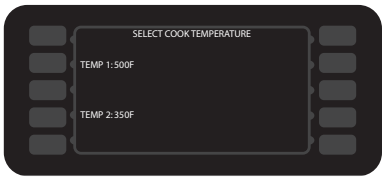


Figure 8: Cook Temperature Select

The oven can store either one or two cook temperatures. To select a temperature, press the adjacent soft key.

Each temperature has 10 food groups assigned to it, and each group consists of 10 food items (100 items per temperature). The operator will only be able to cook items associated with the selected temperature; to cook other items on the menu, a new temperature must be selected.

NOTE: If both temperature settings are the same, this screen will be bypassed and access to all 200 food items will be allowed.

Step 3: Warming Up

Figure 9: Warming Up

During this step, the oven warms to the selected or pre-set temperature.

Step 4: Soaking

Once the oven temperature reaches the set point, the oven will continue to warm for eight minutes to ensure the cook cavity surfaces absorb enough heat so as to not affect cooking results. This process is called "soaking."

Step 5: Ready to Cook or "Idle"

⚠ WARNING: Inside of oven and oven door are hot!

1. Place the food into the oven.
2. Select a food group by pressing its adjacent soft key, or press the Up or Down key for additional food groups, if available.
3. Select an item to cook by pressing its adjacent soft key.

Step 6: Adjusting the Time

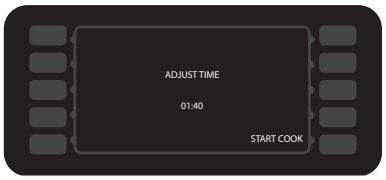


Figure 10: Adjust Time

The Adjust Time option is turned off by default. If you want the ability to modify the cook time before each cook cycle, this feature can be turned on from the "Options" screen (see page 14).

1. If the "Adjust Time" screen appears, change the cook time if needed by using the number keys.
2. Press Enter or the bottom-right soft key to confirm and begin cooking.

Step 7: Cooking

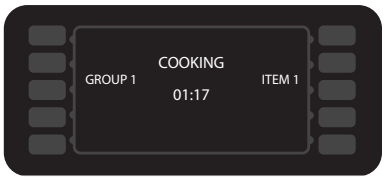


Figure 11: Cooking

NOTE: To immediately terminate a cook cycle, press the Back/Stop key.

NOTE: If the oven door is opened during a cook cycle, the cycle will pause until the door is closed and "Resume" is selected.

Step 8: Remove Food from Oven

Figure 12: Cooking Done

⚠ WARNING: Dish and inside of oven/oven door are hot!

Open the oven door and check/remove food.

Step 9: Additional Cooking Options

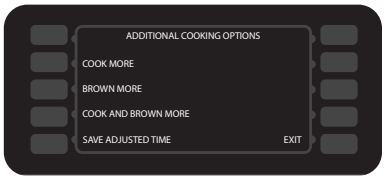


Figure 13: Additional Cooking Options

The "Additional Cooking Options" screen is turned off by default. If you want the ability to cook a product beyond the original cook time, you can enable this feature from the "Options" screen (see page 14).

If the "Additional Cooking Options" screen appears and the food product requires more cooking:

- Select "cook more" if the inside of the food item is undercooked.
- Select "brown more" if the outside of the food item requires more browning or crisping.
- Select "cook and brown more" if both the inside and outside of the food item are not done.
- Select "save adjusted time" to save any change to the cook time made during Step 6. Note that this option is not available if "Adjust Time" is disabled.
- Select "exit" to return to the food group selection screen.

Step 10: Cooling Down

Figure 14: Cooling Down

When finished cooking for the day, press the On/Off key to turn the oven off and begin cooling down.

During this step, the oven blows cool air into the cook cavity to return it to approximately 150°F (66°C), at which point the oven is safe to clean.

Info Mode
Test Mode
Edit Mode

Overview of the Info Mode

The Info Mode serves four main purposes:

1. To display oven information.
2. To provide access to Test Mode and additional diagnostic tools for service technicians.
3. To turn oven options and features on/off.
4. To update oven settings.

To access the Info Mode, simply press the Info key when the oven is either off or cooling down. To toggle between screens 1 and 2, press the Up or Down key.

From screen 1 of the Info Mode (Figure 15):
- View the oven serial number
- View the oven software version
- View the menu part number and revision
- View the last temperature selected to cook
- View the electrical compartment temperature
- Scroll through counters (total cook time, magnetron time, total oven on time, and cumulative cook count)
- View the operating voltage (North America models only)
- Access the fault log
- Access service phone numbers

From screen 2 of the Info Mode (Figure 16):
- Access Test Mode
- Access the "Options" screen
- Set the language (not available on all models)
- Set the date/time
- Increase/decrease the tone volume (sound)
- Access the "Load Menu" screen
- Turn the F2 Alarm on or off (page 14 for details)

Viewing Cook Counter/Time Logs

From the Info Mode (Figure 15), press the R1 soft key:
- Once to display total cook time.
- Twice to display total magnetron time.
- Three times to display total "oven on" time.
- Four times to display a cumulative cook count.

Viewing the Fault Log

Figures 17-18. For more information on faults, see pages 35-36. To zero the fault counters, select Clear All.

From the Info Mode (Figure 15), press the R3 soft key to view the fault log (Figure 17). To view time stamps of each fault occurrence (Figure 18), press the soft key adjacent to the fault code.

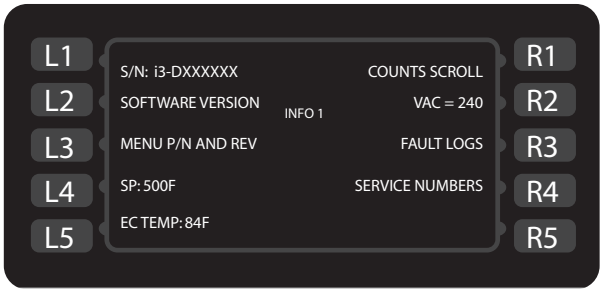


Figure 15: Info Mode Screen 1

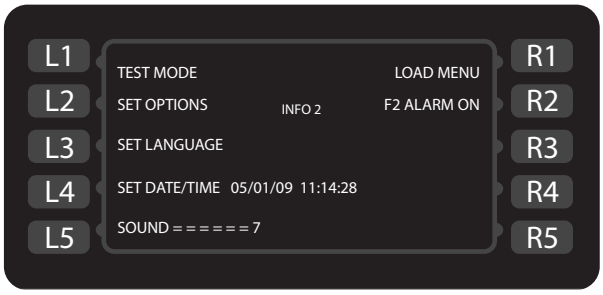


Figure 16: Info Mode Screen 2

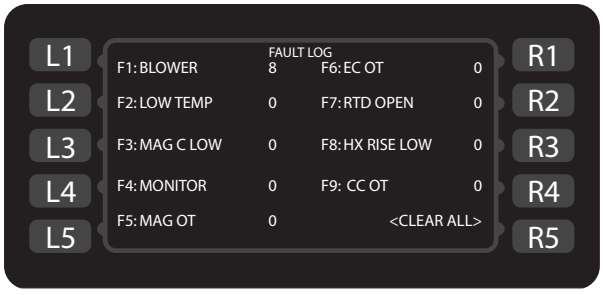


Figure 17: Fault Log

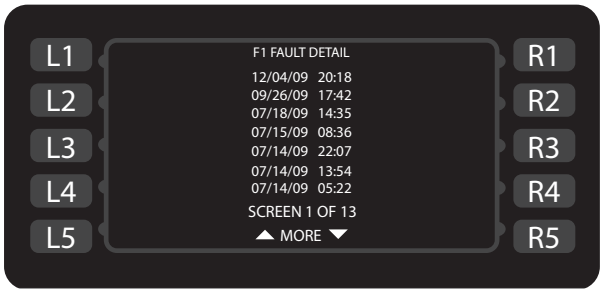


Figure 18: Fault Time Stamp Detail

Viewing the Service Numbers

From the Info Mode (Figure 15, page 13), press the R4 soft key to view technical support contact info.

Options Screen

From screen 2 of the INFO MODE (Figure 16, page 13), press the L2 soft key to access the Options screen (Figure 19). When prompted, enter the password 9 4 2 8 and press the Enter key.

From the Options screen, the following oven options can be turned on or off:

- Adjust Time screen (see cooking step 6, page 11 for more details)
- Cook More screen (see cooking step 9, page 12 for more details)
- Edit Mode (page 19 for more details)
- Load Menu screen (page 15 for more details)
- Demo Mode (TurboChef use only)
- DHCP (TurboChef use only)
- Oven Type: Ensure this option is set to "i3."

Setting the Language

NOTE: Not available on some oven models.

From screen 2 of the INFO MODE (Figure 16, page 13), press the L3 soft key to set a different language.

Setting the Date/Time

Having an accurate date and time is important for logging oven counts, diagnostics, and fault conditions, should any occur. The oven time and date are set at the time of manufacture; however, the technician may at some point be required to make an adjustment.

From screen 2 of the INFO MODE (Figure 16, page 13), press the L4 soft key to access the "Set Date/Time" screen (Figure 20).

To set the date and time,

1. Use the L3 and R3 soft keys (middle left and middle right) to navigate between fields.
2. Use the numeric keypad to enter the month, day, and year, followed by the hour and minute.

NOTE: The clock is a 24-hour clock (e.g., 20:30 = 8:30 PM).

3. Select "Save" to save your changes or "Cancel" to cancel and exit the screen.

NOTE: The oven will not retain the time if it is left unplugged for two or more weeks.

Adjusting the Volume

From screen 2 of the INFO MODE (Figure 16, page 13), press the L5 soft key to adjust the beeper volume.

Setting the F2 Alarm

Under normal operation, the F2 alarm will terminate a cook cycle if the CC temperature falls below 84°F (47°C) of the set point. Turning off the F2 alarm will prevent a cook cycle from being terminated if the fault is discovered. In either event, the fault will be logged and should necessitate a service call.

To turn the F2 alarm on or off, press the R2 soft key from the Info 2 screen (Figure 16, page 13).

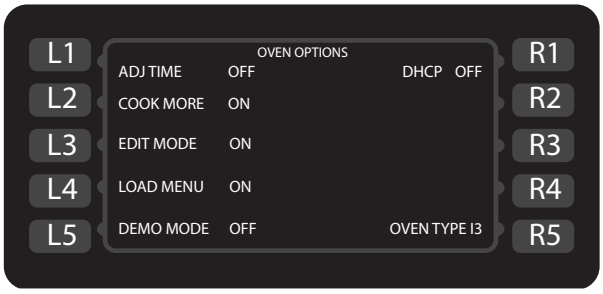


Figure 19: Options Screen

Figure 20: Set Date/Time

Making a Copy of the Oven Menu

From screen 2 of the INFO MODE (Figure 16, page 13), press the R1 soft key to access the Load Menu screen.

NOTE: This feature can be turned on or off via the "Options" screen (Figure 19, page 14).

To save a copy of the oven menu to a smart card,
1. Insert the smart card (Figure 21).
2. Press the L2 soft key "Save to Card."
3. Verify the oven beeps and reads "FINISHED."

To save a copy of the oven menu to a USB drive,
1. Insert the USB drive (Figure 21).
2. Press the L5 soft key "Save to USB."
3. Verify the oven beeps and reads "FINISHED."

Updating the Oven Menu

From screen 2 of the INFO MODE (Figure 16, page 13), press the R1 soft key to access the Load Menu screen.

NOTE: This feature can be turned on or off via the "Options" screen (Figure 19, page 14).

To load a menu to the oven via smart card,
1. Insert the smart card (Figure 21).
2. Press the L1 soft key "Load from Card."
3. Verify the oven beeps and reads "FINISHED."

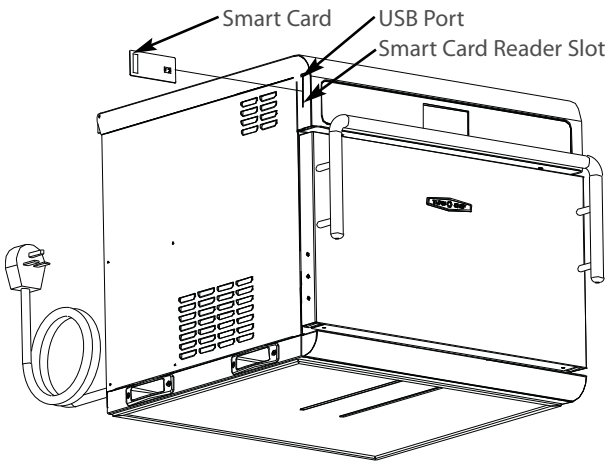


Figure 21: Inserting Smart Card/USB Device

To load a menu via USB drive,
1. Verify the menu on the USB drive is named MENU.BIN.
2. Verify the menu on the USB drive is in a folder named TC_MENUS. This folder must not be a sub-folder of any other folder.
3. Insert the USB drive (Figure 21).
4. Press the L4 soft key "Load from USB."
5. Verify the oven beeps and reads "FINISHED."

Updating the Oven Firmware

Updating the oven firmware whenever TurboChef releases a new version will help ensure the oven maintains the best possible functionality. Updates can be obtained from www.turbochef.com (link at bottom of screen), and loaded to smart cards via ChefComm. Physical copies can also be ordered and shipped. Contact TurboChef for more details.

From the Oven Off screen,
1. Insert the smart card (see Figure 21).
2. While the oven is either cooling down or off, press and hold the Info key until the oven resets (approximately 5 seconds).
3. When the oven beeps one long high tone, the load was successful. Remove the card and if a second card was provided, insert it.
4. When the oven beeps one long high tone, remove the second card to begin the reboot process.
5. When the oven restarts and the display turns on, the update is complete. Remove the smart card.
6. Verify the oven type is set to "i3" (Figure 19).

NOTE: If the update is unsuccessful, the display will remain off and the oven will beep one long, low tone. If this occurs, repeat the above procedure. If the update fails multiple times, contact TurboChef.

⚠ CAUTION: The oven will be inoperable if the firmware update is unsuccessful!

Resetting the Oven

Resetting the oven is one way to potentially clear an error message, should one occur. When the oven is cooling down or off, press and hold the INFO key for 5 seconds.

Test Mode - Testing Oven Parts

From screen 2 of the INFO MODE (Figure 16, page 13), press the L1 soft key to access TEST MODE (Figure 22). When prompted, enter the password 9 4 2 8 and press the Enter key. From TEST MODE, the oven's components can be tested independently, or a comprehensive/selective self-test can be run. Unless otherwise specified, idle airflow is set to 10% and the stirrer motor is turned on.

Top and Bottom Blower

Each blower can be tested independently of the other, at any speed setting. While one blower is being tested, the other will remain at 10% idle airflow.

Press the L2 soft key (Figure 22) to increase top blower speed in 10% increments.

Press the L3 soft key (Figure 22) to increase bottom blower speed in 10% increments.

Heaters

Press and hold the L4 soft key (Figure 22) to turn on the heaters. They will turn off upon releasing the L4 soft key.

Magnetron Test

Press and hold the L5 soft key (Figure 22) to turn on the magnetrons. They will turn off upon releasing the L5 soft key.

Stirrer

Press the R1 soft key (Figure 22) to turn the stirrer on/off.

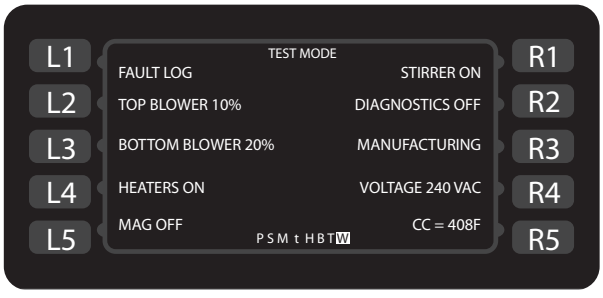


Figure 22: Test Mode

Status Indicators

Figure 22. The status indicators are located at the bottom of the TEST MODE screen, and consist of:

- P = Primary switch (backlit = open)
- S = Secondary switch (backlit = open)
- M = Monitor switch (backlit = open)
- t = Magnetron thermostat (backlit = open)
- H = Heaters (backlit = off)
- B = Bottom blower (backlit = off)
- T = Top blower (backlit = off)
- W = Microwave (backlit = off)

In Figure 22:

- All three door switches are engaged (closed).
- The magnetron thermostat is closed.
- The heaters are on.
- Both blower motors are on.
- Microwave is not being used.

Fault Log

Press the L1 soft key (Figure 22) to access the fault log.

This fault log is identical to the one accessible from INFO MODE screen 1 (page 13).

Turning Diagnostic Mode On/Off

Press the R2 soft key (Figure 22) to place the oven in DIAGNOSTIC MODE. When in DIAGNOSTIC MODE, the oven displays additional cooking parameters during a cook cycle, including:

- Event currently being cooked
- Time left per event
- % wave, % top air, % bottom air
- Status indicators
- Group and recipe name
- Actual cook cavity temperature
- Set point temperature

For normal oven operation, ensure DIAGNOSTIC MODE is turned off.

Manufacturing Mode

Press the R3 soft key (Figure 22, page 16) to place the oven in MANUFACTURING MODE (Figure 23). When in MANUFACTURING MODE, the following tests and settings can be accessed:

- Microwave leakage test
- Microwave power test
- Burn in
- Serial number edit
- Temperature measurement (F or C)
- Self test
- Erase/default oven settings

Microwave Leakage Test

Press the L1 soft key (Figure 23) to initiate the microwave leakage test. The oven will warm up to 500°F (260°C). When warmup is complete, insert the water load and follow the steps on pages 25-26.

Microwave Power Test

This test should only be performed by the manufacturer.

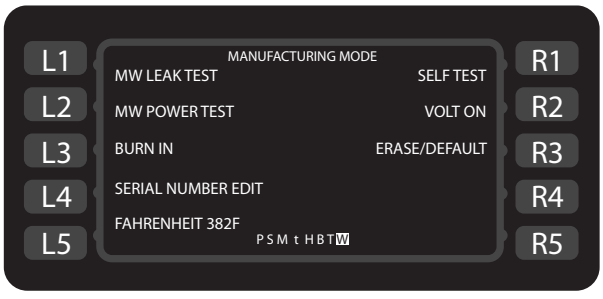


Figure 23: Manufacturing Mode

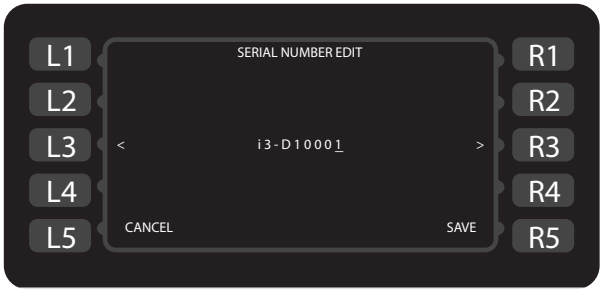


Figure 24: Serial Number Edit

Burn-In

Press the L3 soft key (Figure 23) to initiate a 25-minute burn-in. This feature helps ensure all cavity walls reach thermal equilibrium before testing is conducted.

Serial Number Edit

Press the L4 soft key (Figure 23) to access the "Edit Serial Number" screen (Figure 24). To edit the serial number:

- Use the number/letter keys to change a character. After one second, the cursor will advance to the next character.
- Press the R3 soft key to advance to the next character.
- Press the L3 soft key to return to the previous character.
- Press the R5 soft key to save the changes or the L5 soft key to cancel.

Changing Temperature Measurement Setting

Press the L5 soft key (Figure 23) to change the temperature to either Fahrenheit or Celsius.

Self Test

Press the R1 soft key (Figure 23) to access Self Test. From the Self Test screen (Figure 25):

- L1 soft key initiates a comprehensive self test. The oven will check the door switches, blowers, magnetrons, and heaters in sequence.
- L2 soft key initiates a door switch test only.
- L3 soft key initiates a blower test only.
- L4 soft key initiates a magnetron test only.
- L5 soft key initiates a heater test only.

When each test completes, the oven will display PASS or FAIL.

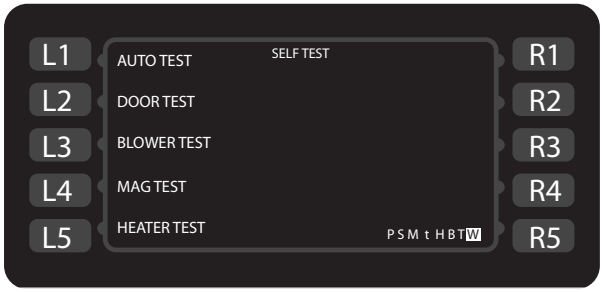


Figure 25: Self Test

Volt On

This setting should not be changed in the field unless instructed by TurboChef. Press the R2 soft key (Figure 23, page 17) to enable/disable the voltage from displaying in INFO MODE. Typically, this setting is disabled for ovens installed outside the United States.

Erase/Default Oven Settings

⚠ CAUTION: Settings cannot be retrieved once an erase option is confirmed.

Press the R3 soft key (Figure 23, page 17) to access the Erase screen. From the Erase screen (Figure 26),

- Press the L2 soft key to erase counters and fault logs.
- Press the R2 soft key to erase counters, fault logs, menu settings, temperature settings, serial number, date, and time. Doing so will also default all oven options (page 14 for more detail) to OFF, with the exception of "Load Menu."

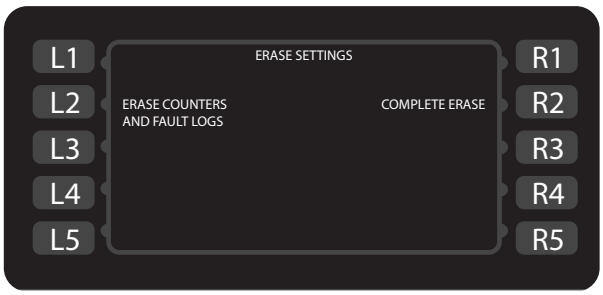


Figure 26: Erase Settings

Overview of the Edit Mode

The EDIT MODE serves three main purposes:
1. To edit set temperatures.
2. To edit names of food groups and recipes.
3. To edit recipe settings.

To access the EDIT MODE,
1. When the oven is off or cooling down, press the Info key.
2. Press the Down key to access screen 2 and select "Set Options."
3. Enter the password 9 4 2 8 and press ENTER.
4. From the Set Options screen, press the R3 soft key to turn EDIT MODE on.
5. Press the On/Off key to exit the Options screen.
6. Press the On/Off key again to enter EDIT MODE.

Changing Set Temperatures

The i3 oven can store two set temperatures. Think of each temperature as a "block" of 10 food groups with 10 items each, or 100 items per temperature.

If a menu was loaded via smart card or USB (page 15), the temperatures are already set - they need not be changed. The set temperature should never be changed during normal operation.

Changing a set temperature is not recommended as a way to compensate for over-cooking or under-cooking. Rather, consult your authorized distributor or TurboChef Customer Service if recipe settings are not cooking as desired.

To change a set temperature,
1. Place the oven in EDIT MODE (see adjacent).
2. Select the temperature to change by pressing either the L2 (temperature 1) or L4 (temperature 2) soft key (Figure 27).
3. Using the number keys, enter the new set temperature (valid temperature range is 350-525°F (175-275°C)).
4. Press the Enter key to confirm the change, or the Back/Stop key to cancel.

Figure 27: Temperature Edit Screen

Changing Food Group/Item Name

To change a food group or item name,

1. Place the oven in EDIT MODE (see page 19).
2. Select a "block" of food groups by pressing either the R2 (temperature 1 groups) or R4 (temperature 2 groups) soft key (Figure 27, page 19).
3. Select the group that contains the item(s) you want to edit (Figure 28).
4. Select an item to edit (Figure 29).
5. From the "Recipe Edit" screen (Figure 30), edit the food group name (top of the screen):
   - Use the numeric keypad to change a character.
   - Press the R1 soft key to advance to the next character.
   - Press the L1 soft key to return to the previous character.
   - Press the R3 soft key to save changes.
6. Edit the item name (top of the screen):
   - Press the Down key to move to the "Item Name" field.
   - Use the instructions provided in step 5 to edit the item name.

Figure 28: Select Food Group

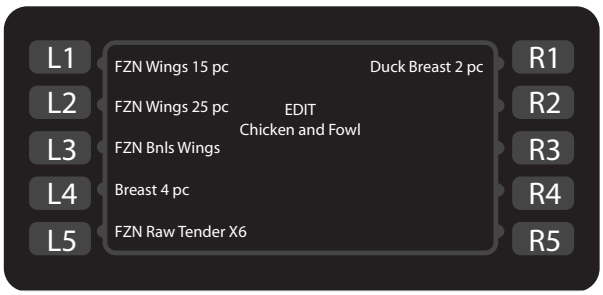


Figure 29: Select Recipe to Edit

Changing Recipe Settings

To access the Recipe Edit screen, follow the steps in the adjacent section titled *Changing Food Group/Item Name*.

To change recipe settings,

1. From the Recipe Edit screen (Figure 30), press the Down key to move the cursor to the desired "Event Setting" field.

NOTE: To help make navigation easier, the currently-selected field will be displayed in the top-right corner of the display. In Figure 30, the cursor is in the "% Time" column.

2. Use the number keys to adjust event settings:
   - % Time (0-100% in 1% increments). The sum of the percentages across eight events must equal 100.
   - % Top Blower (10-100% in 10% incr.)
   - % Bottom Blower (10-100% in 10% incr.)
   - % Microwave (0-100% in 10% incr.)
3. Press the R4 "Time" soft key (or press the Down key) to move the cursor to the total time field.
4. Use the number keys to adjust the cook time.
5. Press the R3 soft key to save changes.

NOTE: For the save to take effect, the cursor must be advanced past the field that was last edited.

6. If desired, press the R5 soft key to test the new settings. The oven may require time to warm up.
7. When all editing is complete, return to the Options screen and turn off the EDIT MODE (see page 14) to allow access to regular cook mode.

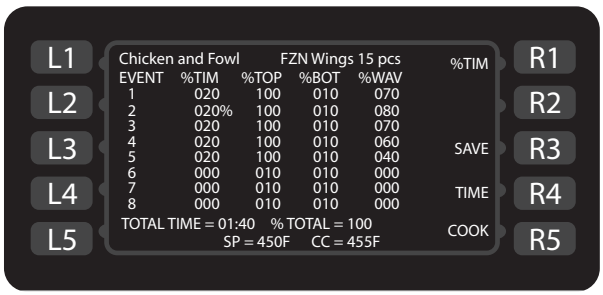


Figure 30: Recipe Edit Screen

Oven Systems

Convection System

The convection system is designed to rapidly heat, clean, and recirculate air into the cook cavity.

This section contains information about the following components:

- Blower motor (bottom)
- Blower motor (top)
- Blower motor controller
- Heater element
- Jetplate (bottom)
- Jetplate (top)
- Top jetplate insert (not all models)
- Stirrer motor and assembly

For information on accessing and removing parts, see the Appendix.

Blower Motor (Bottom)

The bottom convection motor is a brushless AC switch reluctance type. Its top speed is 7100 RPM at 1 HP. The bottom blower motor is controlled by a proprietary controller and spins clockwise.

The bottom blower motor can be tested in TEST MODE (see page 16).

Blower Motor (Top)

The top convection motor is a brushless AC switch reluctance type. Its top speed is 7100 RPM at 1 HP. The top blower motor is controlled by a proprietary controller and spins counterclockwise.

The top blower motor can be tested in TEST MODE (see page 16).

Blower Motor Speed Controller (BMSC)

The motor controller is proprietary and will only operate the convection motors described above. It is controlled via 0-10 VDC speed command from the control board. The blower motor controller can be tested in TEST MODE by testing the blower motors (see page 16). For additional F1 fault troubleshooting, see page 37.

Heater Elements

There are two main convection helical heaters, each rated at 3000 watts at 208 VAC with a resistance of 14.4 ohms. The convection heater is controlled by the K4/K5 solid state relay.

The heater element can be tested in TEST MODE (see page 16).

Jetplate (Bottom)

The bottom jetplate channels air from the bottom blower motor into the cook cavity.

Jetplate (Top)

The top jetplate channels air from the top blower into the cook cavity after it passes through a stirrer.

The i3 utilizes two versions of the top jetplate. Ovens with serial numbers between 00001 and 01000 use a ceramic top jetplate. All i3 ovens with a serial number of 01001 or greater use a stainless top jetplate that incorporates a glass insert (see below for details).

⚠ CAUTION: Mishandling the ceramic top jetplate or glass insert can result in breakage.

Top Jetplate Insert

The top jetplate insert is installed only on ovens with a serial number of 01001 or greater (see page A-3 of the appendix for an illustration). To replace the insert:

1. Ensure the cook cavity has cooled; do not attempt to remove the top jetplate insert until the oven off screen is displayed.
2. Loosen the two screws that hold the insert in place.
3. Rotate the retainer clips away from the insert.
4. Replace the insert and while holding it in place, reposition the clips and re-tighten the screws.

⚠ CAUTION: The top jetplate insert is glass. Be careful when removing or reinstalling it.

Stirrer Motor and Assembly

The stirrer is responsible for evenly distributing hot air and microwaves that are launched from the top of the oven into the cook cavity. The stirrer is driven by a motor that remains on during a cook cycle or when the oven is in TEST MODE. The stirrer motor turns off when the cook cavity temperature recedes below 150°F (66°C).

The i3 utilizes two versions of the stirrer and the stirrer shaft. Ovens with serial numbers between 00001 and 01000 use a mica stirrer, whereas ovens with a serial number of 01001 or greater use a metal stirrer. Each stirrer type also has a unique shaft. For details including part numbers and illustrations, see pages A-2 through A-3 and A-6 through A-7 of the appendix.

The stirrer motor can be tested in TEST MODE (see page 16).

Convection System Troubleshooting

The following faults may occur in relation to the convection system:

- F1: Blower (see page 37)
- F2: Low Temp (see page 38)
- F6: EC Temp (see page 41)
- F7: Thermo (see page 41)
- F8: Heat Low (see page 42)
- F9: CC Temp (see page 42)

The following cooking performance issues may occur in relation to the convection system:

- Food not cooking properly (see page 45)

Oven Door

This section contains information about the following components:

- Oven door
- Interlock switches
- Hinges and counter-balance assembly

This section also contains procedures for:

- Removing/reinstalling the oven door
- Adjusting the oven door
- Adjusting the oven door switches
- Adjusting the counter-balance assembly
- Measuring RF leakage for microwave safety

For information on accessing and removing parts, see the Appendix.

NOTE: The proper fit and adjustment of the oven door is essential for safe and reliable oven operation.

The oven door assembly consists of a shunt plate, skin, and handle. Each of these items can be replaced independently.

Removing/Reinstalling the Oven Door

To remove or reinstall the oven door, follow the steps below. For illustrations, see page A-3 of the appendix.

1. Ensure the oven has cooled to 150°F (66°C).
2. Open the oven door to its full open position.
3. Remove the #8-32 screws (three per side).
4. Carefully remove the oven door by pulling it away from the oven. It will slide off the hinges, and the hinge blocks will stay in place. See Figure A-1, page A-3 of the appendix.

⚠ CAUTION: The door hinge is preloaded and can pinch or injure if allowed to slam closed without counterbalance pressure.

5. To reinstall or fit a new door, carefully slide it back over the hinge blocks and replace the six #8-32 screws (three per side).
6. Verify that the door is parallel to the oven frame. If it is not parallel, adjust the door per the instructions in the following section.
7. From TEST MODE (page 16), check the status indicators P, S, and M to verify the switches engage (door closed) and disengage (door open) properly. If they do not, adjust the switches per the instructions on page 24.
8. Complete a MW leakage test (pages 25-26).

Adjusting the Oven Door

Ensuring the oven door is parallel to the cavity frame is essential for safe and proper oven operation. If the door is misaligned, follow the proceeding steps.

⚠ CAUTION: This procedure should be performed while oven is hot. To avoid burns, be careful when adjusting the oven door.

1. Turn the oven on and warm it to its operating temperature. If two temperatures are present, warm the oven to the higher of the two temperatures.
2. Remove the oven side panels.
3. Remove the switch assemblies from each side.
4. Loosen the four screws that hold the hinge assembly to the gusset plates (Figure 31A).
5. Slide the door in and out of the cavity, making sure the gaps between the door and cavity face are the same distance on each side. Figures 31B and 31C show misaligned doors.
6. Tighten the four screws and open/close the door multiple times to confirm adjustment.
7. Reinstall the door switches.
8. With the door closed, set the left side switch (primary) so the paddle is closed but not pushing or binding on itself.
9. Set the right side switches (secondary and monitor) so they are completely closed but not pushing or binding on themselves.
10. Turn the oven on and enter TEST MODE (page 16 for more details).
11. Observe the status indicators when opening and closing the door and confirm the sequence (PSM open, MSP closed). If necessary, adjust the switches (page 24) and reconfirm the sequence.
12. Reinstall the side panels.
13. Perform a MW Leak Test (pages 25-26).

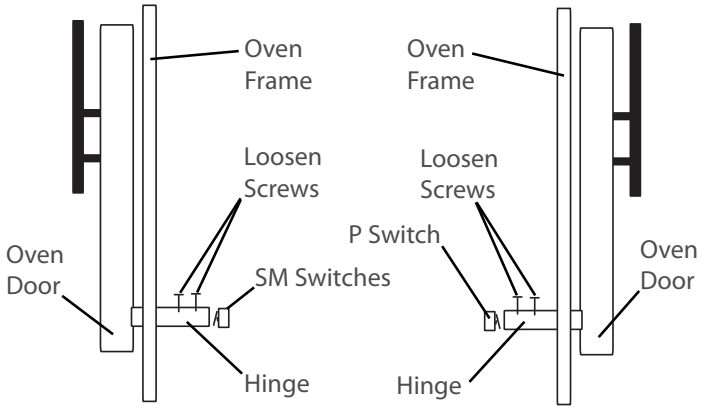


Figure 31A: Properly Adjusted Door - Side Views

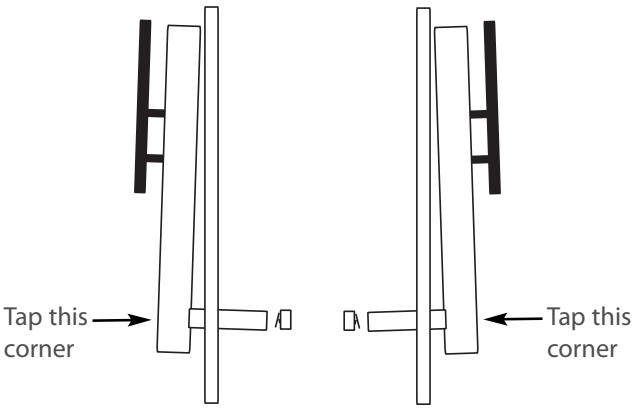


Figure 31B: Door Misaligned 1 - Side Views

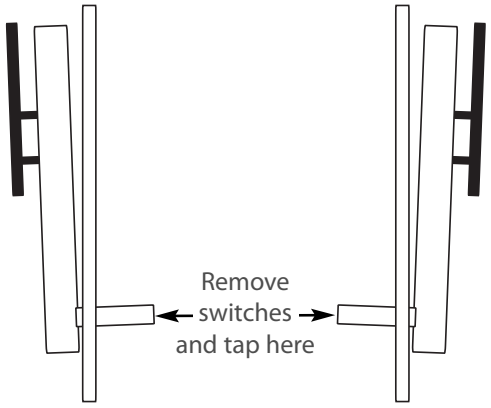


Figure 31C: Door Misaligned 2 - Side Views

Interlock Switches

The primary, secondary, and monitor interlock switches engage and disengage in sequence to ensure a proper seal. When the door is opened, the switch sequence is P, S, M. Subsequently, the sequence is M, S, P when the door is closed.

Adjusting the Door Switches

Proper door switch sequence is critical. The safety interlock system is designed to disable the microwave circuit (blow F3 fuse) if the monitor door switch opens before the primary or secondary switches during microwave operation. Verifying the door switchs equence is highly recommended when servicing an oven with a blown F3 fuse.

⚠ WARNING: This procedure requires work while the oven is hot. To avoid burns, be careful when adjusting the door switches.

1. Ensure the oven door is closed.
2. Verify the oven door is adjusted properly and the oven is at operating temperature before attempting to adjust the door switches. If the oven has multiple set temperatures, use the highest temperature. If a door adjustment is required, refer to pages 22 and 23 for details.
3. If an open door switch is not allowing the oven to preheat, remove the side panels and loosen and move both the left and right door switch brackets to close the switches.

NOTE: Step 3 is not a completed repair. Proper switch operation must be confirmed before putting the oven into service; continue to step 4.

4. With the oven at operating temperature, enter TEST MODE (page 16) to view the status indicators of the primary, secondary, and monitor door switches.
5. Adjust the position of the door switches/ brackets to ensure the proper sequence.

NOTE: Opening the door must show the sequence as P, S, M. Closing the door must show the opposite sequence M, S, P. After final adjustments, retighten the hex bolts and confirm the brackets are secure.

6. Reinstall the side panels.
7. Perform a MW leakage test (page 25)

Hinges and Counter-Balance Assembly

The door hinges and counter-balance assembly ensure the door consistently opens and closes smoothly. The counter-balance assembly also allows the door to remain open at convenient positions; i.e., partially open, fully open.

Adjusting the Counter-Balance Assembly

Adjustments either increase or decrease the amount of counter-pressure being applied to the door.

⚠ WARNING: This procedure requires work while the oven is hot. To avoid burns, be careful when adjusting the counter-balance assembly.

NOTE: In Figure 32, some oven components have been removed for clarity. The adjustment procedure must be performed with the counter-balance and hinges installed to the oven chassis.

1. Heat the oven to operating temperature.
2. Ensure the door is adjusted properly and closed. Refer to page 22 “Adjusting the Oven Door.”
3. Remove both side panels.
4. Remove both left and right side door switch assemblies for access to the adjustment area.
5. Remove the last gusset screws (closest to the switch assemblies) for tool access.
6. Use adjustment tool P/N i5-9387 to check the distance between the bracket and counter-balance assembly (see Figure 32).
7. Insert the adjustment tool and use a 3/32” hex wrench to tighten the adjustment screw against the bracket so the tool cannot slide out.
8. Turn the adjustment screw two complete revolutions counter-clockwise to achieve the proper tension and remove the tool.
9. Repeat steps 5-8 for the other side.
10. Reinstall the gusset screws and tighten.
11. Reinstall the door switch assemblies, verifying the switches are in the closed position (i.e., snug against the actuator).
12. Warm up the oven, allowing the additional 8 minute “soak” to achieve thermal equilibrium in the cook cavity.
13. Adjust the door switches to ensure the proper opening and closing sequence (details adjacent).
14. Reinstall all components and side panels.
15. Test for microwave leakage before returning the oven into service (page 25).

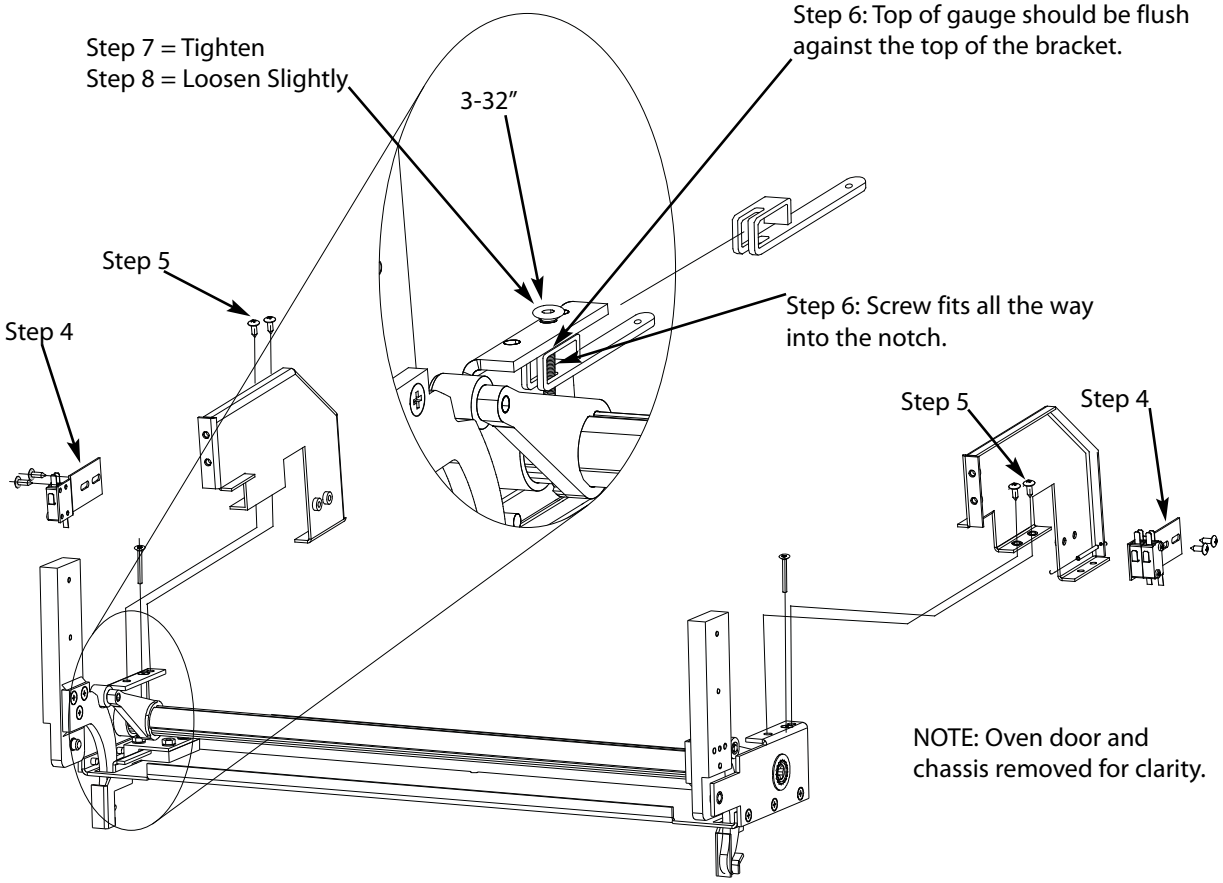

Step 7 = Tighten
Step 8 = Loosen Slightly
3-32″
Step 6: Top of gauge should be flush against the top of the bracket.
Step 5
Step 4
Step 6: Screw fits all the way into the notch.
Step 5
Step 4
NOTE: Oven door and chassis removed for clarity.

Figure 32: Counter-Balance Adjustment

Measuring RF Leakage for Microwave Safety

⚠ WARNING: Procedure requires work while the oven and water loads are hot. To avoid burns, be careful when testing.

An RF (microwave) leakage test must be performed at the conclusion of the following service tasks:

- Door removal, replacement and/or adjustment
- Wave guide removal and /or replacement
- Magnetron removal and/or replacement
- Door switch adjustment and/or replacement
- Counter-balance assembly adjustment and/or replacement

⚠ WARNING: If the unit fails the microwave leakage test (leakage greater than 5mW/cm^2), the oven must be taken out of service immediately until the defect is corrected. In addition, the CDRH Regulation 21 Subpart C, 1002.20 requires that leakage readings of over 5mW/cm^2 must be reported to the manufacturer.

To measure RF leakage,

1. Place the oven in warm up (page 10, steps 1-3) and allow it to warm to the set temperature (approximately 15 minutes if the oven starts cold).
2. Once the oven has warmed up, place the oven in TEST MODE (see page 16). From TEST MODE, select "MFG Mode."
3. From the Manufacturing Mode screen, select "MW Leak Test" and follow the instructions on the screen (also detailed in the following steps).

Continued on page 26.

4. Place a water load into the cook cavity. The water load must conform to the following specifications:
   - Volume: 275 ml ± 15 ml
   - Temperature: 68ºF ± 9ºF (20ºC ± 5ºC)
   - Vessel: Low form, 600 ml beaker with an inside diameter of approximately 3.35" (85 mm) and made of Pyrex or equivalent.
5. Close the oven door and press the Enter key. The microwave system will turn on.
6. Position the microwave survey meter where the door seals to the oven frame, moving it while testing as shown in Figure 33.
7. Measure microwave emission around the door, moving the meter sensor at 0.5 inches (1.3 cm)/second. As microwave leakage is observed while moving the sensor, note any meter spike areas that come close to 5mW/cm^2 for later re-measurement.
8. Replace the water load every 60 seconds until the test is completed, and also after scanning the door.
9. Close the oven door and return the meter probe to any meter spike areas and allow the probe to remain in the spike area for 17 seconds. Note the highest reading obtained.

NOTE: There may be several places on the door that require this procedure. If so, start out with a fresh water load each time a new area is measured, or if measurement of an area takes longer than 60 seconds.

10. After each test is complete, open the oven door and dispose of the hot water.

Oven Door Troubleshooting

The following faults may occur in relation to the oven door:

- F4: Monitor (see page 40)

The following issues may occur in relation to the oven door:

- "Cook Door Open" message when door is closed (see page 43).

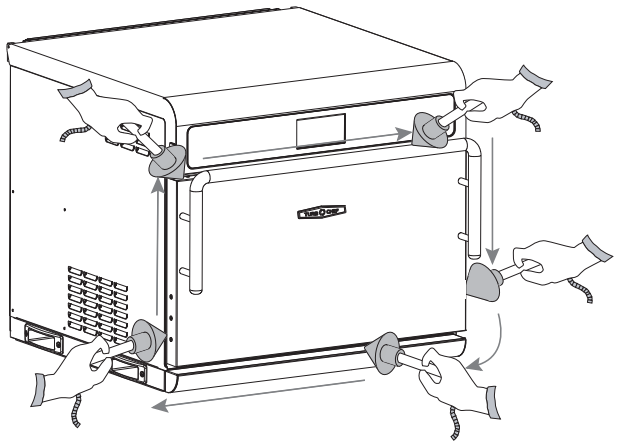


Figure 33: Survey Meter Placement

Microwave System

The i3 oven employs left and right microwave systems. In the case of an over-current situation, the F3 fuse will blow, shutting off both systems immediately.

This section contains information about the following components:

- Capacitors
- Filament transformers
- High-voltage diodes
- High-voltage transformers
- Magnetrons
- Stirrer motor and assembly
- Waveguides

This section also contains procedures for:

- Testing a capacitor
- Wiring the filament transformers
- Testing a high-voltage diode
- Wiring the high-voltage transformers
- Testing a filament or high-voltage transformer
- Testing a magnetron for an open/shorted filament

For information on accessing and removing parts, see the Appendix.

Capacitors

- Capacitor rating is 0.91uF, 2500 VDC for all 60 Hz installations (except Japan).
- Capacitor rating is 1.15uF, 2500 VDC for all 50 Hz installations.
- Capacitor rating is 0.85uF, 2500 VDC for 60 Hz Japan installations.

Testing a Capacitor

⚠ DANGER: Never attempt any measurement of the capacitors while they are enabled. Lethal voltage will be present. Measure only in compliance with these procedures.

1. Disconnect the oven from the power source.
2. Remove the top cover of the oven.
3. Fully discharge the capacitor.
4. Isolate the capacitor from the circuit.
5. Check for an open or shorted capacitor by placing ohmmeter leads between the capacitor terminals:
   - Rising/escalating ohm readings = capacitor OK
   - Constant infinite resistance = capacitor open
   - Constant very low resistance = capacitor shorted
6. If the capacitor is not open or shorted, set the meter to measure capacitance and again place the leads between the capacitor terminals. The meter reading should equal the label value, plus or minus 10%. If not, replace the capacitor.

Filament Transformers

For better operation and reliability, the oven uses separate transformers in order to preheat the magnetron filaments.

The control energizes the filament transformers for approximately five seconds prior to energizing the microwave circuit via the high-voltage transformers. When in operation, the filament transformers supply approximately 3.15 VAC at 9-10 amps to each magnetron filament. The filament transformers are controlled via the K1 relay.

Wiring the Filament Transformers

⚠ DANGER: Never attempt to measure the secondary voltage values of the filament transformers when they are connected to the magnetron circuit. Lethal voltage will be present.

The installation of filament transformers is straightforward. Filament transformers are wired in-phase and in-line. Refer to the schematic on page 49, detailing the proper wiring.

To verify correct wiring (North America), measure the voltages between terminals 1 & 2 and 1 & 3 on FT1 and FT2. The voltages must be 208 and 240 VAC respectively.

Continued on page 28.

NOTE: The terminals with the orange wire always go to Terminal 3 on US models.

To verify correct wiring (International), measure the voltage between the taps on FT1 and FT2. The voltage must be 220 VAC (Latin America), 200 VAC (Japan), or 230 VAC (International).

High-Voltage Transformers

The high-voltage transformers are of ferro-resonant design, which limits fault currents and minimizes magnetron power changes due to input voltage changes. The high-voltage transformer supplies the high voltage for the voltage doubler circuit. They are controlled via the K2 relay.

Wiring the High-Voltage Transformers

⚠ DANGER: Never attempt to touch, contact, or measure the secondary voltage values of the high-voltage transformers while they are enabled. Lethal voltage will be present.

The proper reinstallation of a high-voltage transformer is critical. Upon removing a high-voltage transformer, make sure to note where each wire was installed. See the oven schematic on page 49 for the wiring detail.

As shown in the schematic, transformers are installed mirror opposite and wired 180º out-of-phase. It is essential for longevity that the high-voltage transformers remain 180º out-of-phase. This can be checked by placing a volt meter across terminals T1-1 and T2-1 (primary voltage).

With the microwave system energized, the volt meter will read the incoming voltage (different readings for different electrical installations). If the meter reads 0 VAC, the high-voltage transformers are most likely wired in-phase. As a last check, energize the microwave system and verify the voltages between the taps on each high-voltage transformer.

The wiring issue must be corrected prior to returning the oven to service, as the voltages must be:

- NORTH AMERICA: 208 VAC between 1 & 2 and 240 between 1 & 3.
- LATIN AMERICA: 220 VAC
- JAPAN: 200 VAC
- INTERNATIONAL: 230 VAC

NOTE: The terminals with the orange dot/orange wire always go to terminal 3 on US models.

Testing a Filament or HV Transformer

⚠ DANGER: Never attempt to measure the secondary voltage values of the transformers when they are connected to the magnetron circuit. Lethal voltage will be present.

1. Disconnect the AC power source.
2. Remove the top cover of the oven and discharge the high-voltage capacitors.
3. Disconnect all the wires in question going to the transformer.
4. Use an ohmmeter to check the impedance of the primary and secondary winding. Refer to the adjacent resistance table to determine if the transformer is OK. If the resistance is different than the table indicates, replace the transformer.

High-Voltage Diodes

The high-voltage diode (Figure 34) is assembled by connecting several 1000-1500 volt semi-conductor diodes in a series to increase the reverse voltage capability. In the circuit, the high-voltage diode conducts to prevent the filament voltage from becoming positive, thus as the high-voltage winding of the transformer goes to a peak of 2400 volts, the high-voltage capacitor is charged to 2400 volts.

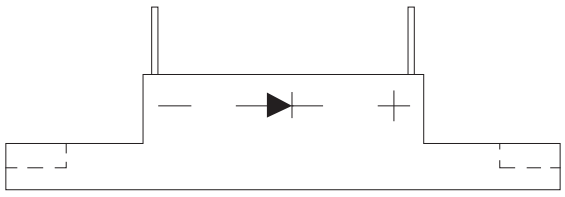


Figure 34: High Voltage Diode

High Voltage Transformer Part Numbers	Primary Voltage, Frequency, Taps, and Resistance	Secondary Taps and Resistance
NGC-3062-1	208 VAC, 60 Hz, 1 & 2, 0.819–1.001 Ω 240 VAC, 60 Hz, 1 & 3, 0.972–1.188 Ω	4, Ground, 53.60–65.52 Ω
NGC-3062-2	230 VAC, 50 Hz, 1 & 2, 0.972–1.188 Ω	3, Ground, 57.52–70.30 Ω
NGC-3062-3	200 VAC, 50/60 Hz, 1 & 2, 0.784–0.958 Ω	3, Ground, 55.75–68.13 Ω
Filament Transformer Part Numbers	**Primary Voltage, Frequency, Taps, and Resistance**	**Secondary Taps and Resistance**
NGC-3061-1	208 VAC, 60 Hz, 1 & 2, 17.49–21.37 Ω 240 VAC, 60 Hz, 1 & 3, 20.61–25.19 Ω	4, 5, very low resistance - if reading is open, transformer has failed.
NGC-3061-2	230 VAC, 50 Hz, 1 & 2, 18.99–23.21 Ω	3, 4, very low resistance - if reading is open, transformer has failed.
NGC-3061-3	200 VAC, 50/60 Hz, 1 & 2, 15.70–19.18 Ω	3, 4, very low resistance - if reading is open, transformer has failed.

High Voltage and Filament Transformer Resistance Table

When the high-voltage winding starts to go toward negative, the high-voltage diode becomes non-conducting with the charged high-voltage capacitor in series with the high-voltage winding. When the transformer gets to its negative peak of -2400 volts, the voltage applied to the filament is -4500 volts. The high-voltage diodes are rated at 16 kVDC.

Testing a High-Voltage Diode

⚠ DANGER: Never attempt to measure high voltage directly. Death or serious injury could result.

1. Disconnect the oven from the power source.
2. Remove the top cover of the oven.
3. Fully discharge the capacitors.
4. Connect the voltage meter in series with the diode.
5. Using a multimeter set to DC voltage, connect one meter lead to one side of a 9-volt battery and the other lead to one side of the diode.
6. Connect the other side of the 9-volt battery to the other side of the diode. DC voltage should only be present on the meter in one direction.
7. Switch the meter leads on the diode, which will cause the opposite reading to be visible. Depending on the voltage of the battery, voltage between 5-7 VDC should be present in only one direction and 0-0.1 VDC in the other direction.

Magnetrons

Figure 35. Magnetrons supply the RF energy at 2.45 GHz and begin to oscillate when they are supplied with approximately 4.1 kVDC at approximately .350 mA. During operation, each magnetron will output a nominal 1 kW of power.

If replacement is required, conduct a microwave leakage test (pages 25-26) after installing a new magnetron.

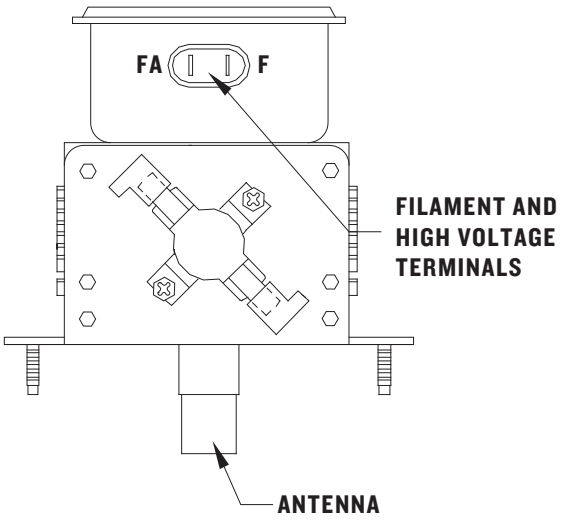


Figure 35: Magnetron

Testing a Magnetron for an Open/Shorted Filament

⚠ DANGER: The only safe way to test a magnetron is by a resistance test of its filament. Never attempt to measure the magnetron using any other method while the microwave system is on. Death or serious injury could occur.

1. Disconnect the AC power source.
2. Remove the top cover of the oven and discharge the high-voltage capacitors.
3. Isolate the magnetron from the circuit by removing the wires from the F and FA terminals. Figure 35.
4. An ohmmeter connected between the filament terminals (F, FA) should indicate a reading of less than 1 ohm. Figure 35.
5. A continuity check between either filament terminal and the magnetron chassis should indicate an infinite resistance (open).

⚠ CAUTION: Be careful to not allow debris into the waveguides when servicing the magnetrons.

Stirrer Motor and Assembly

The stirrer is responsible for evenly distributing hot air and microwaves that are launched from the top of the oven into the cook cavity. The stirrer is driven by a motor that remains on during a cook cycle or when the oven is in TEST MODE. The stirrer motor turns off when the cook cavity temperature recedes below 150°F (66°C).

The i3 utilizes two versions of the stirrer and the stirrer shaft. Ovens with serial numbers between 00001 and 01000 use a mica stirrer, whereas ovens with a serial number of 01001 or greater use a metal stirrer. Each stirrer type also has a unique shaft. For details including part numbers and illustrations, see pages A-2 through A-3 and A-6 through A-7 of the appendix.

The stirrer motor can be tested in TEST MODE (see page 16).

Waveguides

The waveguides channel microwaves into the cook cavity. If debris or contamination gets into the waveguides, the life of the magnetrons may be shortened. Be careful to not allow debris into the waveguides when servicing the magnetrons.

Microwave System Troubleshooting

The following faults may occur in relation to the microwave system:

- F3: Magnetron Current Low (see page 39)
- F5: Magnetron Over Temperature (see page 40)

The following issues may occur in relation to the microwave system:

- Electrical component failure (blank or scrambled display, damaged control board, etc.)
- Food not cooking properly (see page 45)

Control System

This section contains information about the following components:

- Control board
- Display
- Electrical compartment cooling fans
- Electrical compartment cooling fan thermostat
- Electrical compartment thermocouple
- EMI filter
- Fuses
- High-limit thermostat
- Keypad
- Magnetron cooling fan
- Magnetron thermostats
- Power supply
- Relay (K1 - Filament)
- Relay (K2 - Anode)
- Relay (K3 - Monitor)
- Relay (K6 - Voltage)
- Relay (K7 - Mag fan)
- Relay (K8 - Stirrer)
- RTD
- Smart card reader
- Solid state relay (K4/K5 - Heater)
- Speaker
- USB port
- Wire harness
- Voltage sensor

Control Board

The control board controls each electrical component of the oven. See page 49 for a schematic. 24 VDC can be measured at pin 2 of the J7 connector.

Display

The TFT high-resolution display is the primary user interface.

Electrical Compartment Cooling Fans

The cooling fans (located at the rear of the oven) are actuated by the cooling fan thermostat when the temperature of the electrical compartment reaches 120°F (49°C).

Electrical Compartment Cooling Fan Thermostat

The cooling fan thermostat actuates the rear cooling fans when the electrical compartment temperature reaches 120°F (49°C).

Electrical Compartment Thermocouple

The electrical compartment thermocouple measures the temperature of the electrical compartment. If the temperature of the electrical compartment is above 158°F (70°C), an F6: EC TEMP fault will display. The control board checks the temperature of the electrical compartment once every 60 seconds.

The electrical compartment thermocouple cannot be replaced on its own if it fails; rather, the control board must be replaced.

EMI Filter

The EMI filter helps suppress the amount of RF interference emitted by the oven.

Fuses

The F1 and F2 fuses are 12-amp, ATMR. The F3 fuse is 20-amp ATMR.

The F1 fuse (via blue wire) or F2 fuse (via brown wire) is designed to blow in case of an over-current situation relative to the following components:

- BMSC motor controller
- Electrical compartment cooling fans
- Filament transformers
- Magnetron cooling fan
- Power supply
- Stirrer motor

The F3 fuse is designed to blow in case of an over-current situation relative to the microwave system (magnetrons, HV transformers, diodes, capacitors), or a failure with the door interlock switches. See page 24 for door switch adjustment details.

High Limit Thermostat

The high limit thermostat is a three-pole, manual-reset thermostat with a trip point of 572ºF (300ºC). The thermostat interrupts power to the main convection heater in the event of an abnormal condition.

Reset the high-limit thermostat by pressing the reset button (Figure 36).

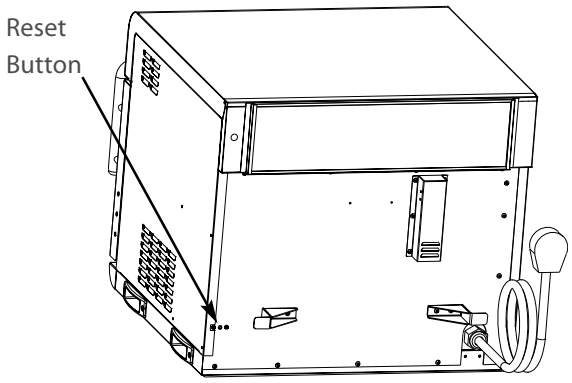


Figure 36: High-Limit Reset Button

Keypad

The keypad is a 7 x 10 matrix membrane switch. For details on key functions, see page 9.

Magnetron Cooling Fan

The magnetron cooling fan supplies air to the magnetrons, and is actuated by the K7 relay.
It operates at:

- 208/240 VAC (60 Hz installations with voltage sensing)
- 220 VAC (60 Hz installations with no voltage sensing)
- 230 VAC (50 Hz installations)
- 200 VAC (Japan installations)

Magnetron Thermostats

The magnetron thermostats are “open-on rise.” They are designed to open at 212ºF (100ºC), which triggers an F5 fault.

NOTE: The magnetron thermostats are wired in series. If one opens, the control will switch off both microwave systems until the open thermostat closes. The thermostats are self-resetting.

Power Supply

The power supply outputs 24 VDC at 40 watts to the control board.

Relay - K1 Filament

The K1 relay is a 240 VAC, 24 VDC coil, 20-amp, sealed single-pole relay. It switches power to the filament transformers.

Relay - K2 Anode

The K2 relay is a 30-amp, double-pole, double-throw, 24 VDC relay coil. It switches power to the magnetron high-voltage transformers.

Relay - K3 Monitor

The K3 relay is a 30-amp, double-pole, double-throw, 24 VDC relay coil. It shorts L1 and L2 if the monitor door switch opens before the primary or secondary door switches.

Relay - K6 Voltage

The K6 relay is a 30-amp, three-pole, double-throw, 24 VDC relay coil. Utilized in North America only, it switches between 208 and 240 VAC on the high-voltage transformer and filament transformer taps (depending on incoming voltage). Through the voltage sensor, the oven defaults to the 240V position and switches to 208 if less than 222 volts is detected. 230V/400V international ovens and all Japan models utilize the N.C. contacts of this relay to power the magnetron circuit.

Relay - K7 Magnetron Cooling Fan

The K7 relay is a 240 VAC, 24 VDC coil, 20-amp, sealed single-pole relay. It switches power to the magnetron cooling fan when the magnetron filaments are actuated. The control board switches off power after 4 minutes, 15 seconds.

NOTE: The 4:15 timer starts over each time the magnetron filaments are actuated.

Relay - K8 Stirrer Motor

The K8 relay is 240 VAC, 24 VDC coil, 20-amp, sealed single-pole. It switches power to the stirrer.

RTD

The RTD is a resistance temperature detector used to detect the cavity temperature. If the display reads "999°F/C", the RTD is open, resulting in an F7 fault. See page 41 for troubleshooting.

Testing Procedure

1. Disconnect power from the oven.
2. Open the top cover of the oven, ensuring the supports are in place.
3. Disconnect the RTD from the control board.
4. Place the RTD in ice water for two minutes.
5. Take a resistance reading of the RTD.
6. If RTD resistance is not 100 Ω, RTD is defective and must be replaced.

NOTE: Use Figure 37 below to determine resistance readings at temperatures other than freezing.

Smart Card Reader

The smart card reader allows the oven operator to load menu or firmware updates from a smart card. An oven's menu can also be saved to a smart card. For instructions, see page 15.

Solid State Relay - K4/K5 Heater

The solid state relay is a 240 VAC, dual 40-amp relay. K4 (right) switches power to heater 1. K5 (left) switches power to heater 2.

Speaker

The speaker provides audible feedback to the oven operator whenever a key is pressed or a task (such as a cook cycle) is completed.

USB Port

The USB port allows the oven operator to load menu or firmware updates from a USB drive. An oven's menu can also be saved to a USB drive. For instructions, see page 15.

Wire Harness

The wire harness distributes power to the oven's electrical components. See page 49 for the schematic.

°F	0°	+20°	+40°	+60°	+80°	+100°	+120°	+140°	+160°	+180°	+200°
0°	90.03Ω	97.39Ω	101.74Ω	106.07Ω	110.38Ω	114.68Ω	118.97Ω	123.24Ω	127.50Ω	131.74Ω	135.97Ω
+200°	135.97Ω	140.18Ω	144.38Ω	148.57Ω	152.74Ω	159.90Ω	161.04Ω	165.17Ω	169.29Ω	173.39Ω	177.47Ω
+400°	177.47Ω	181.54Ω	185.60Ω	189.64Ω	193.67Ω	197.69Ω	201.69Ω	205.67Ω	209.64Ω	213.60Ω	217.54Ω
+600°	217.54Ω	221.47Ω	225.38Ω	229.28Ω	233.17Ω	237.04Ω	240.90Ω	244.74Ω	248.57Ω	252.38Ω	256.18Ω

°C	0°	+10°	+20°	+30°	+40°	+50°	+60°	+70°	+80°	+90°	+100°
0°	100.00Ω	103.90Ω	107.79Ω	111.67Ω	115.54Ω	119.40Ω	123.24Ω	127.07Ω	130.89Ω	134.70Ω	138.50Ω
+100°	138.50Ω	142.29Ω	146.06Ω	149.82Ω	153.58Ω	157.31Ω	161.04Ω	164.76Ω	168.46Ω	172.16Ω	175.84Ω
+200°	175.84Ω	175.91Ω	183.17Ω	186.82Ω	190.45Ω	194.07Ω	197.69Ω	201.29Ω	204.88Ω	208.45Ω	212.02Ω
+300°	212.02Ω	215.57Ω	219.12Ω	222.65Ω	226.17Ω	229.67Ω	233.17Ω	236.65Ω	240.13Ω	243.59Ω	247.04Ω

Figure 37: Temperature/Resistance Relationship Class B. Resistance @ 0°C = 100.0, Alpha = 0.003850

Voltage Sensor

For North America oven models, the oven will detect 208 or 240 incoming voltage.

The initial voltage selection is typically completed before the oven is used by the customer. However, if incoming voltage for the store is different than the pre-set voltage, the operator will be required to select either 208 or 240 after pressing the On/Off key to turn on the oven. The correct voltage will be enlarged on the screen, identifying which option to select.

Control System Troubleshooting

Potentially, any fault may occur in relation to the control system. See section "Fault Code Troubleshooting," pages 37-42.

Potentially, any one of the issues diagnosed in the section "Non-Fault Code Troubleshooting" may occur in relation to the control system. See section "Non-Fault Code Troubleshooting," pages 43-48.

Filtering System

This section contains information about the following components:

- Catalytic converter
- Drain pan
- Air filter
- Vent catalyst

Catalytic Converter

The catalytic converter, a VOC type catalyst, is located behind the rear cook cavity wall and is responsible for cleaning the recirculating airflow. The catalyst functions by substantially lowering the combustion temperature of grease entrained in the air path to approximately the same temperature of the airflow, thus the grease burns and breaks down into CO_2 and H_2O as it passes through the catalytic converter. The catalyst will operate most efficiently at temperatures above 475°F (246°C).

The catalytic converter is self-cleaning. Under normal conditions, it does not need to be cleaned and is not considered to be a component that requires scheduled maintenance. Furthermore, the catalyst material is very sensitive to certain chemical compounds. Irreversible damage can occur if the catalyst is exposed to cleaning chemicals containing phosphates, NaOH, silicates, Na and Potassium Salts. These chemicals are found in most commercial degreasers and cleaners; therefore, use only TurboChef Oven Cleaner when cleaning the oven.

Drain Pan

The drain pan collects debris as it is flushed through the bottom of the cook cavity.

Air Filter

The filter is located on the back of the oven. It helps prevent debris from getting into the electrical compartment. This component requires scheduled maintenance and occasional replacement, as it must be kept clean and in good working condition to ensure proper air circulation to the electrical components of the oven. See page 8, step 13 for detailed instructions.

Vent Catalyst

In addition to the main catalytic converter, the i3 oven contains a catalyst in the vent tube path. This catalyst further assists in the breakdown of grease and particulate matter before the excess air enters the atmosphere.

Filtering System Troubleshooting

The following issues may occur in relation to the filtering system:

- F9: CC Temp (if the catalyst is clogged with grease and debris - see page 42)
- Fire in the cook cavity (if catalytic converter is clogged due to oven not being cleaned regularly).
- Electrical component failure (if filter is not present or is clogged).
- Undesirable flavor transfer.
- Undesirable odor emissions.

Troubleshooting

Overview of Troubleshooting

This section contains information on the following:

- Fault code descriptions
- Fault code troubleshooting
- Non-fault code troubleshooting

For information on accessing TEST MODE, see page 16. For information and illustrations on replacing components, see the appendix.

Fault Code Descriptions

To view the fault log:

1. When the oven is off or cooling down, press the INFO key.
2. Press the R3 soft key to view the fault counters.
3. To view a detailed log of each fault occurrence, press the soft key adjacent to the fault code.

F1: Blower Running Status Bad

This fault is displayed when the motor controller indicates no running status.

The motors and motor controller are monitored continuously in all modes with special handling in the TEST MODE (see page 16). If a fault is detected, the control will terminate a cook cycle and display "F1: Blower."

Upon turning on the oven, the control will attempt to restart the motors. If the restart of both motors is successful, the fault code will be cleared from the display. The fault is also cleared from the display at the onset of cooking or when a blower motor is tested in TEST MODE.

F2: Cook Temperature Low

This fault is displayed if the cook cavity temperature is more than 84ºF (47ºC) below the set temperature after five seconds or more into a cook cycle.

The fault is cleared from the display at the onset of cooking if the cook cavity temperature is within 84ºF (47ºC) of the set temperature or when the heater is tested in TEST MODE (see page 16).

NOTE: The F2 alarm can be turned off to prevent the cook cycle from being interrupted. See page 14 for details.

F3: Magnetron Current Low

This fault is displayed when the current transformer (CT) on the I/O control board detects less than 10 amps. The fault is monitored when the microwave is on during a cook cycle or in TEST MODE.

The fault is cleared from the display at the onset of a cook cycle if the CT detects 10 amps or when the magnetrons are successfully energized in TEST MODE.

F4: Door Monitor Defective

This fault is displayed when the control detects that the monitor interlock switch unlatches before the primary or secondary interlock switches. In addition, this fault will blow the F3 fuse if the microwave high voltage system is energized when the fault occurs. The fault is cleared from the display when the oven is powered off and then back on.

NOTE: See the oven schematic, page 49. The fault is monitored during a cook cycle and in TEST MODE when the microwave is on.

F5: Magnetron Over Temperature

This fault is displayed when either magnetron thermostat reaches 212ºF (100ºC).

The thermostats will reset automatically, and are wired in series. The fault is cleared from the display at the onset of a cook cycle if the thermostat is closed, or when the magnetrons are successfully tested in TEST MODE.

F6: Electrical Compartment Temperature High

This fault is displayed when the EC thermocouple exceeds 158ºF (70ºC). The EC temperature is monitored once per minute.

The fault is cleared from the display if on the next check, the EC thermocouple temperature is below the indicated limit.

F7: RTD Open

This fault is displayed when the control detects that the RTD is "open" for more than two continuous minutes. The display will show a reading of "999ºF/C," indicating the RTD is open.

The fault is cleared when the control detects ohms in a proper range. See Figure 37, page 33 for an ohm/temperature chart.

F8: Heat Low

This fault displays during WARMING UP or TEST MODE if the cook cavity temperature fails to rise at least 14ºF (7ºC) within a given 30 seconds.

F9: Cook Cavity Temperature High

This fault will signal that the catalyst has "flashed" due to excessive grease. The fault occurs when the RTD senses +650°F (343°C) for more than 40 seconds but less than 2 minutes. The fault will only appear in the fault log and will not terminate a cook cycle upon discovery.

Fault Code and Description	When Active				Refer to...
	Warmup	Idle	Cooking	Test Mode	
F1: Blower Running Status Bad	✔	✔	✔	✔	Page 37
F2: Cook Temperature Low			✔		Page 38
F3: Magnetron Current Low			✔	✔	Page 39
F4: Door Monitor Defective			✔	✔	Page 40
F5: Magnetron Over Temperature			✔	✔	Page 40
F6: EC Temperature High	✔	✔	✔	✔	Page 41
F7: RTD Open	✔	✔	✔	✔	Page 41
F8: Heat Low	✔				Page 42
F9: Cook Cavity Temperature High			✔	✔	Page 42

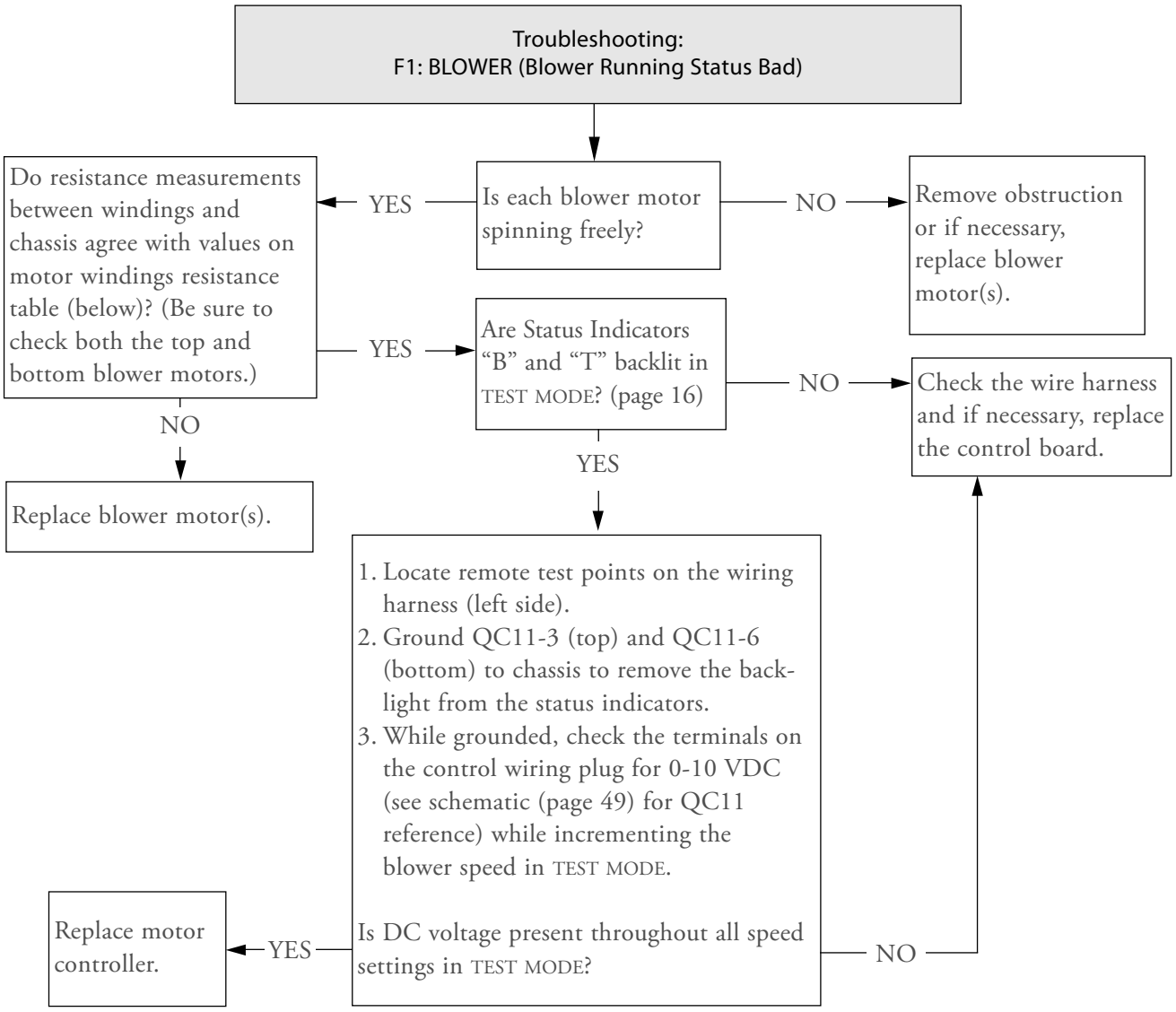
Fault Code Table

Fault codes are listed in order of hierarchy. For example, if during cooking the oven experiences both an F1 and F2 fault, it will report only the F1 fault because the software will halt all actions upon discovering the F1 fault.

Fault codes F1 - F5 and F7 will terminate a cook cycle upon discovery.

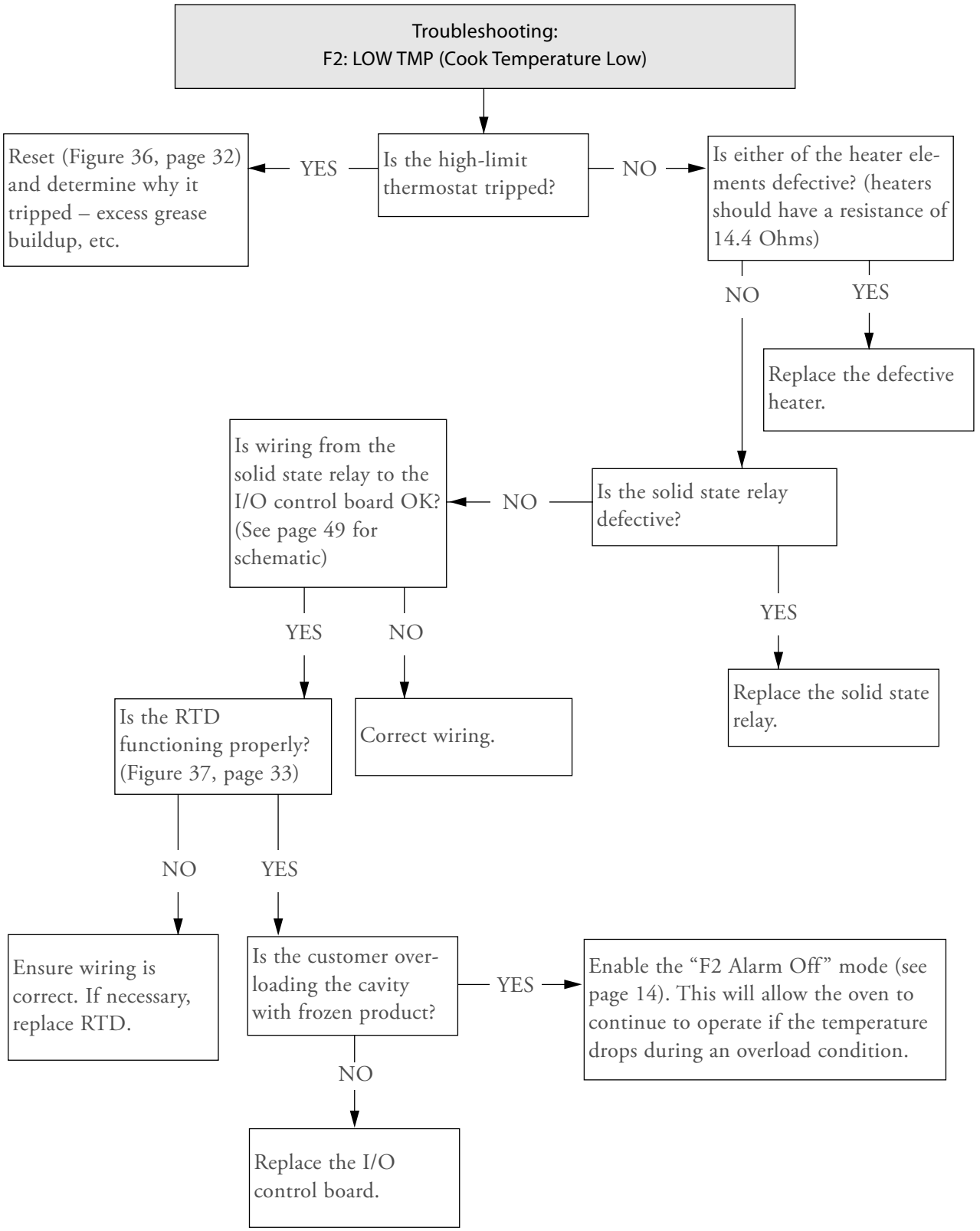
Fault Code Troubleshooting

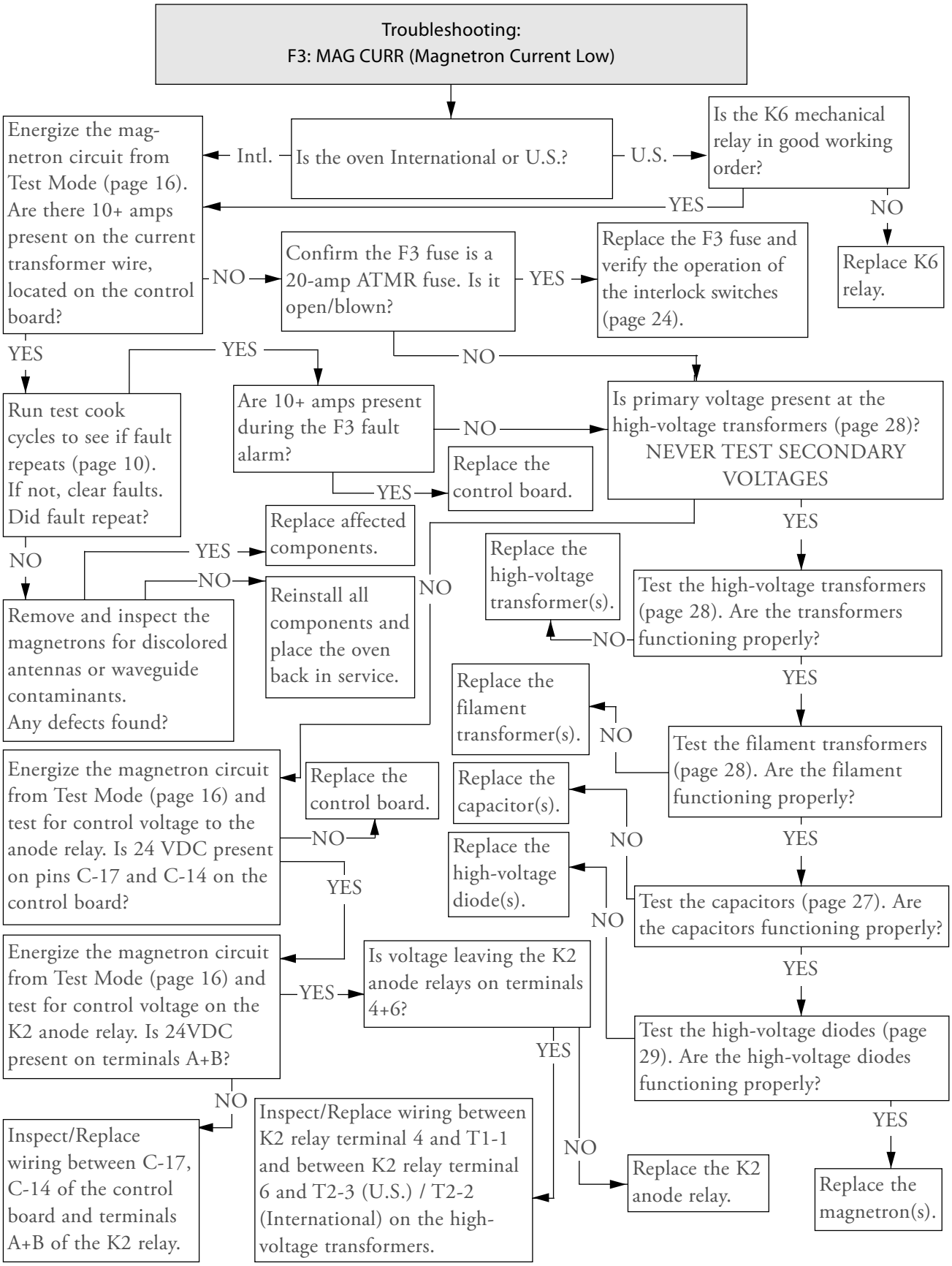
From TEST MODE, you can run oven diagnostics and check fault counts. To access TEST MODE or turn on Diagnostic mode, see page 16. For illustrations on removing/replacing oven components, see the appendix at the end of this manual.

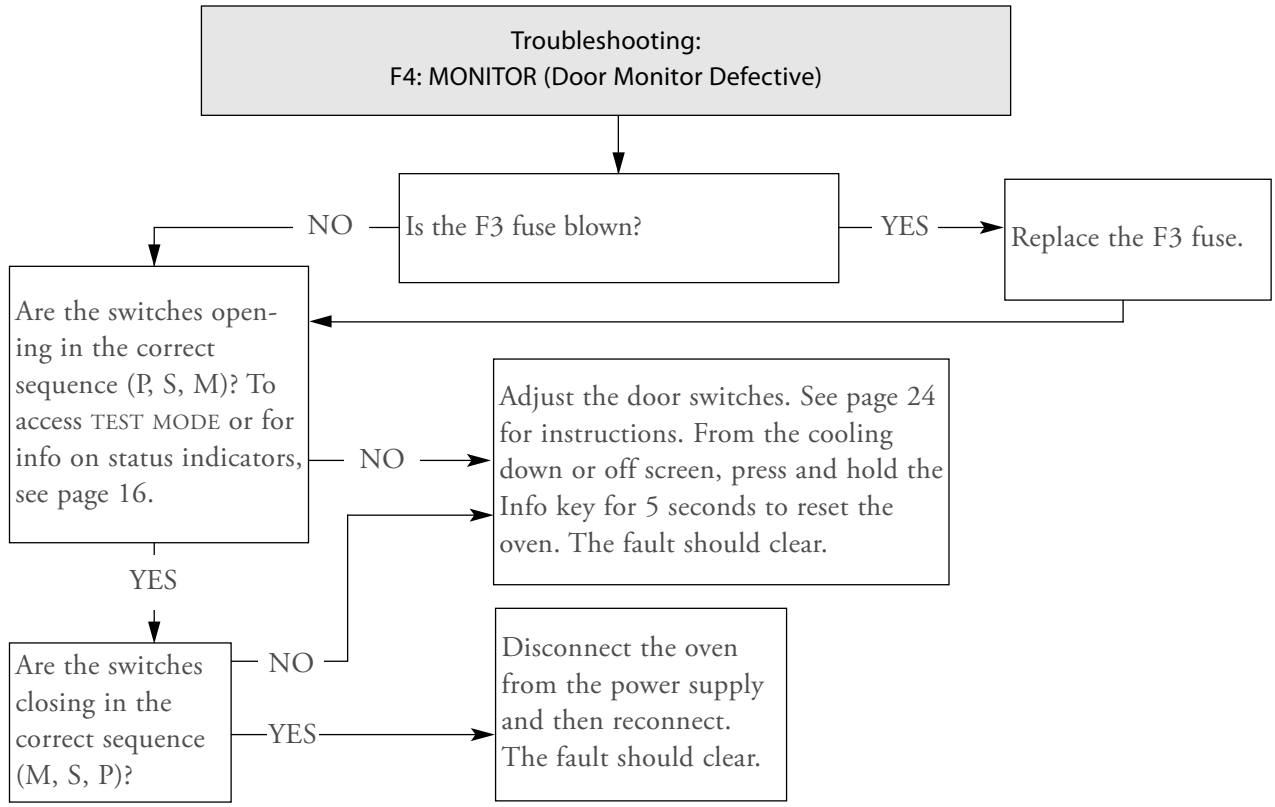

Troubleshooting:
F1: BLOWER (Blower Running Status Bad)
Is each blower motor spinning freely?
YES
NO
Remove obstruction or if necessary, replace blower motor(s).
Do resistance measurements between windings and chassis agree with values on motor windings resistance table (below)? (Be sure to check both the top and bottom blower motors.)
YES
NO
Replace blower motor(s).
Are Status Indicators "B" and "T" backlit in TEST MODE? (page 16)
NO
Check the wire harness and if necessary, replace the control board.
YES
1. Locate remote test points on the wiring harness (left side).
2. Ground QC11-3 (top) and QC11-6 (bottom) to chassis to remove the back-light from the status indicators.
3. While grounded, check the terminals on the control wiring plug for 0-10 VDC (see schematic (page 49) for QC11 reference) while incrementing the blower speed in TEST MODE.
Is DC voltage present throughout all speed settings in TEST MODE?
YES
Replace motor controller.
NO

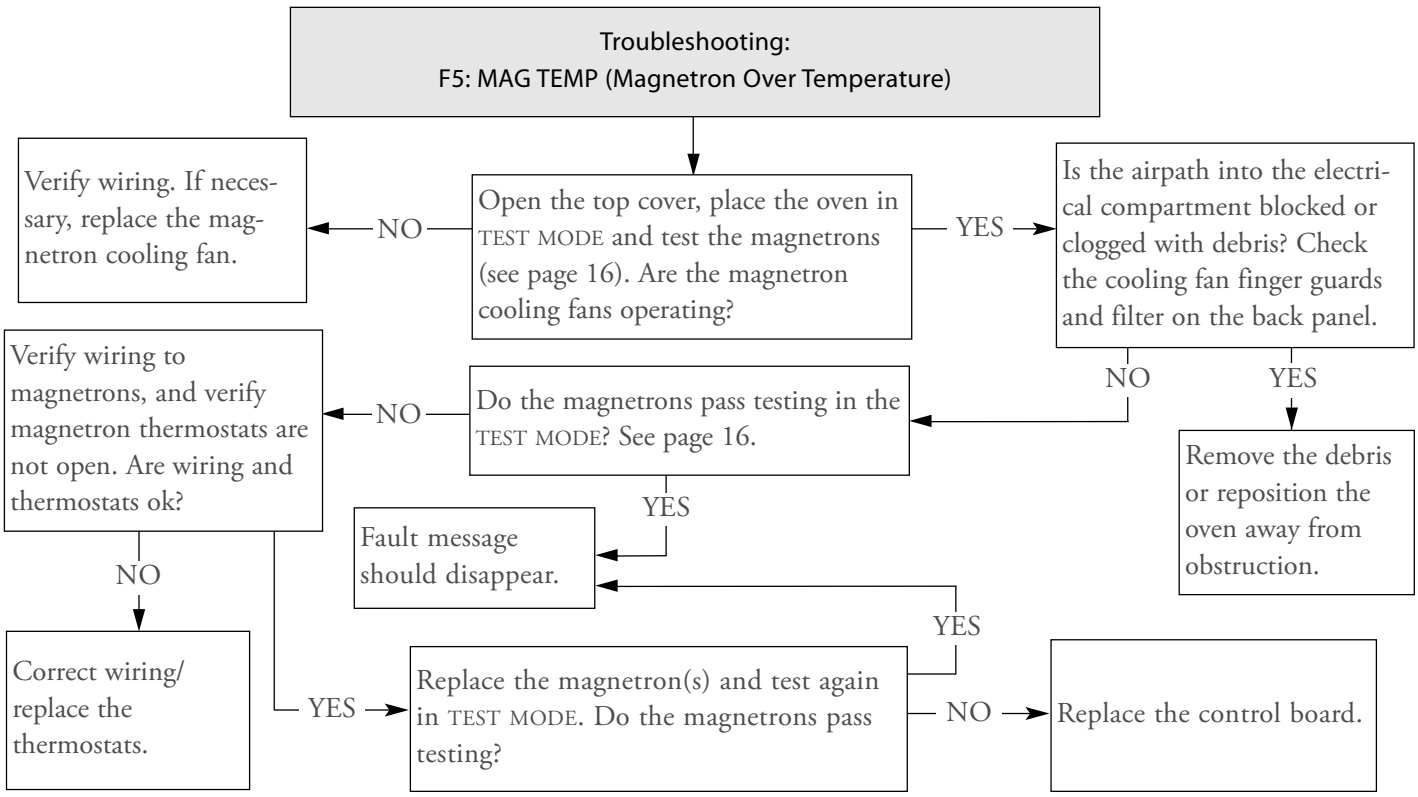
To	From	Description	Expected Resistance
Black	Red	Winding (A-B)	5.9-7.3 Ohms
Black	White	Winding (A-C)	5.9-7.3 Ohms
Red	White	Winding (B-C)	5.9-7.3 Ohms
Black, Red, or White	Green	Windings to Chassis	Open

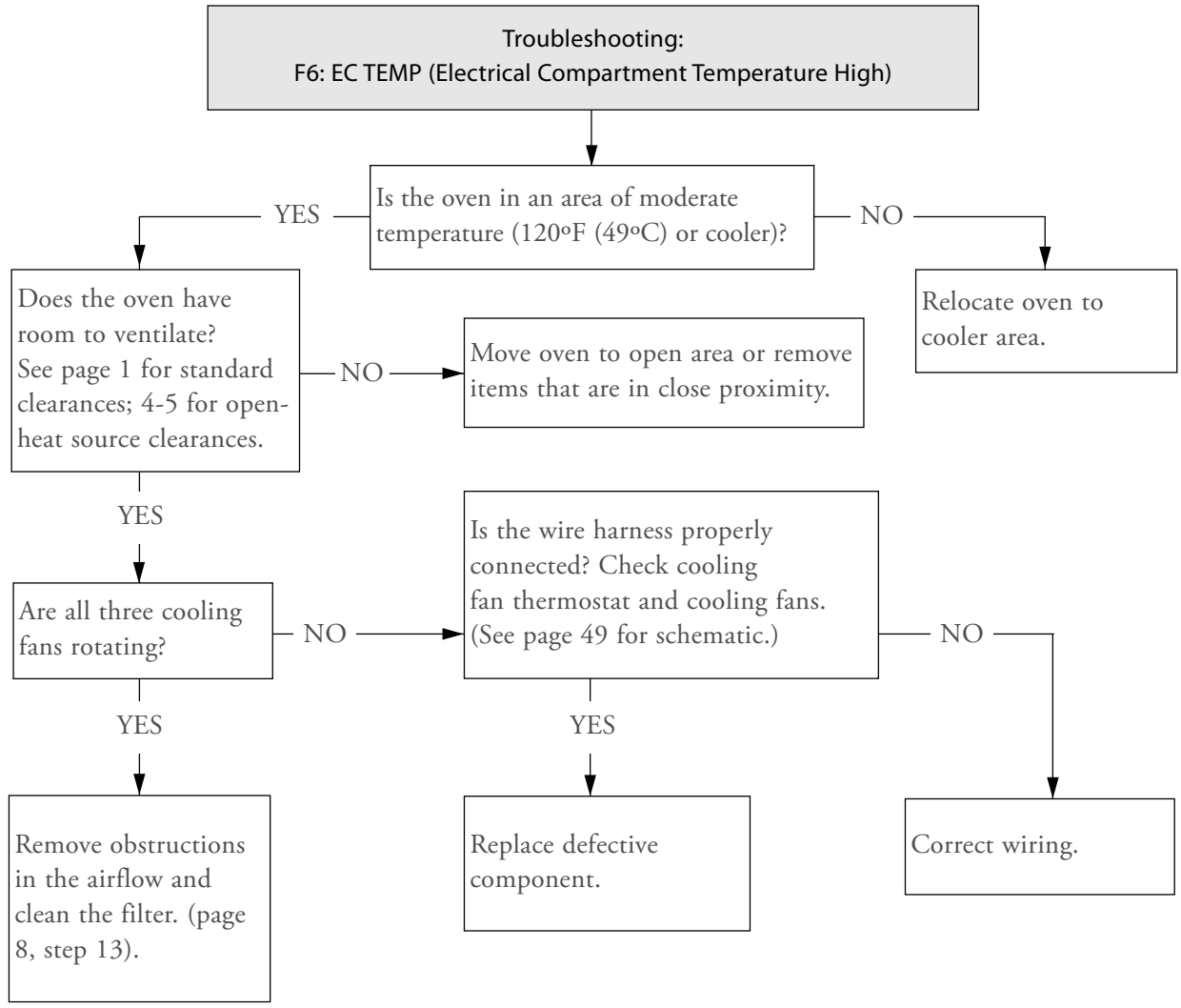
Motor Windings Resistance Table

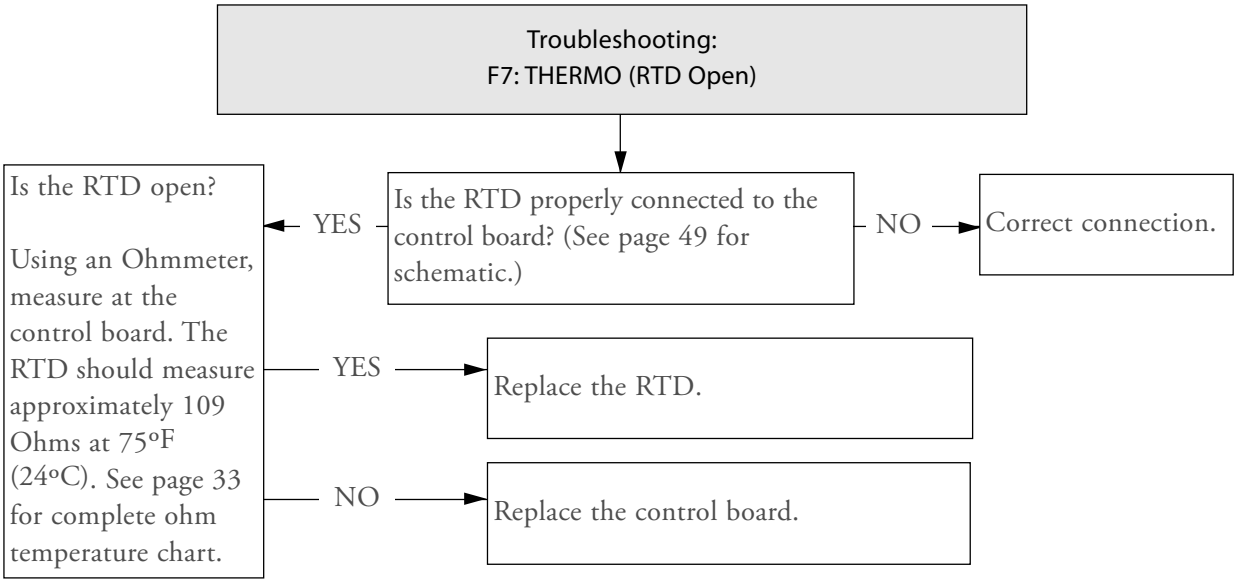

Troubleshooting:
F2: LOW TMP (Cook Temperature Low)
Is the high-limit thermostat tripped?
YES
Reset (Figure 36, page 32) and determine why it tripped – excess grease buildup, etc.
NO
Is either of the heater elements defective? (heaters should have a resistance of 14.4 Ohms)
NO
YES
Replace the defective heater.
Is the solid state relay defective?
YES
Replace the solid state relay.
NO
Is wiring from the solid state relay to the I/O control board OK? (See page 49 for schematic)
YES
NO
Correct wiring.
Is the RTD functioning properly? (Figure 37, page 33)
NO
YES
Ensure wiring is correct. If necessary, replace RTD.
Is the customer overloading the cavity with frozen product?
YES
Enable the "F2 Alarm Off" mode (see page 14). This will allow the oven to continue to operate if the temperature drops during an overload condition.
NO
Replace the I/O control board.

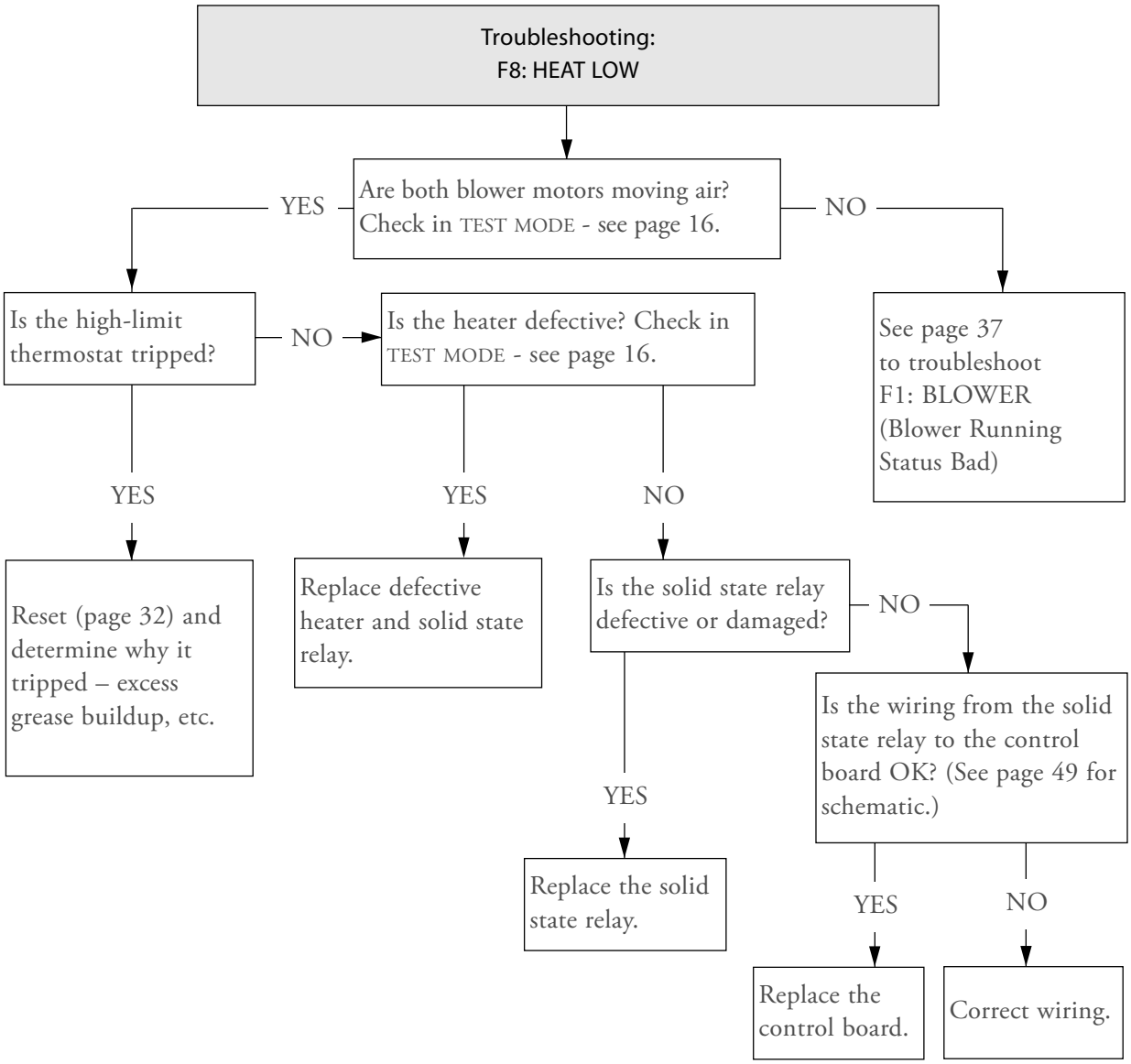

Troubleshooting:
F3: MAG CURR (Magnetron Current Low)
Is the oven International or U.S.?
Intl.
U.S.
Is the K6 mechanical relay in good working order?
YES
NO
Replace K6 relay.
Energize the magnetron circuit from Test Mode (page 16). Are there 10+ amps present on the current transformer wire, located on the control board?
NO
Confirm the F3 fuse is a 20-amp ATMR fuse. Is it open/blown?
YES
Replace the F3 fuse and verify the operation of the interlock switches (page 24).
YES
YES
NO
Run test cook cycles to see if fault repeats (page 10). If not, clear faults. Did fault repeat?
Are 10+ amps present during the F3 fault alarm?
NO
Is primary voltage present at the high-voltage transformers (page 28)? NEVER TEST SECONDARY VOLTAGES
YES
Replace the control board.
YES
Replace affected components.
YES
NO
NO
Remove and inspect the magnetrons for discolored antennas or waveguide contaminants. Any defects found?
NO
Reinstall all components and place the oven back in service.
NO
Replace the high-voltage transformer(s).
Test the high-voltage transformers (page 28). Are the transformers functioning properly?
YES
NO
YES
Replace the filament transformer(s).
NO
Test the filament transformers (page 28). Are the filament functioning properly?
Energize the magnetron circuit from Test Mode (page 16) and test for control voltage to the anode relay. Is 24 VDC present on pins C-17 and C-14 on the control board?
Replace the control board.
NO
Replace the capacitor(s).
NO
YES
YES
Replace the high-voltage diode(s).
NO
Test the capacitors (page 27). Are the capacitors functioning properly?
YES
Energize the magnetron circuit from Test Mode (page 16) and test for control voltage on the K2 anode relay. Is 24VDC present on terminals A+B?
YES
Is voltage leaving the K2 anode relays on terminals 4+6?
YES
Test the high-voltage diodes (page 29). Are the high-voltage diodes functioning properly?
NO
YES
Inspect/Replace wiring between C-17, C-14 of the control board and terminals A+B of the K2 relay.
Inspect/Replace wiring between K2 relay terminal 4 and T1-1 and between K2 relay terminal 6 and T2-3 (U.S.) / T2-2 (International) on the high-voltage transformers.
NO
Replace the K2 anode relay.
Replace the magnetron(s).


Troubleshooting:
F4: MONITOR (Door Monitor Defective)
Is the F3 fuse blown?
NO
YES
Replace the F3 fuse.
Are the switches opening in the correct sequence (P, S, M)? To access TEST MODE or for info on status indicators, see page 16.
NO
Adjust the door switches. See page 24 for instructions. From the cooling down or off screen, press and hold the Info key for 5 seconds to reset the oven. The fault should clear.
YES
Are the switches closing in the correct sequence (M, S, P)?
NO
YES
Disconnect the oven from the power supply and then reconnect. The fault should clear.


Troubleshooting:
F5: MAG TEMP (Magnetron Over Temperature)
Open the top cover, place the oven in TEST MODE and test the magnetrons (see page 16). Are the magnetron cooling fans operating?
NO
YES
Verify wiring. If necessary, replace the magnetron cooling fan.
Is the airpath into the electrical compartment blocked or clogged with debris? Check the cooling fan finger guards and filter on the back panel.
NO
YES
Remove the debris or reposition the oven away from obstruction.
Do the magnetrons pass testing in the TEST MODE? See page 16.
NO
YES
Verify wiring to magnetrons, and verify magnetron thermostats are not open. Are wiring and thermostats ok?
NO
Correct wiring/ replace the thermostats.
YES
Fault message should disappear.
YES
Replace the magnetron(s) and test again in TEST MODE. Do the magnetrons pass testing?
NO
Replace the control board.


Troubleshooting:
F6: EC TEMP (Electrical Compartment Temperature High)
Is the oven in an area of moderate temperature (120ºF (49ºC) or cooler)?
YES
NO
Relocate oven to cooler area.
Does the oven have room to ventilate? See page 1 for standard clearances; 4-5 for open-heat source clearances.
NO
Move oven to open area or remove items that are in close proximity.
YES
Are all three cooling fans rotating?
NO
Is the wire harness properly connected? Check cooling fan thermostat and cooling fans. (See page 49 for schematic.)
NO
YES
YES
Remove obstructions in the airflow and clean the filter. (page 8, step 13).
Replace defective component.
Correct wiring.


Troubleshooting:
F7: THERMO (RTD Open)
Is the RTD open?
Using an Ohmmeter, measure at the control board. The RTD should measure approximately 109 Ohms at 75ºF (24ºC). See page 33 for complete ohm temperature chart.
YES
Is the RTD properly connected to the control board? (See page 49 for schematic.)
NO
Correct connection.
YES
Replace the RTD.
NO
Replace the control board.

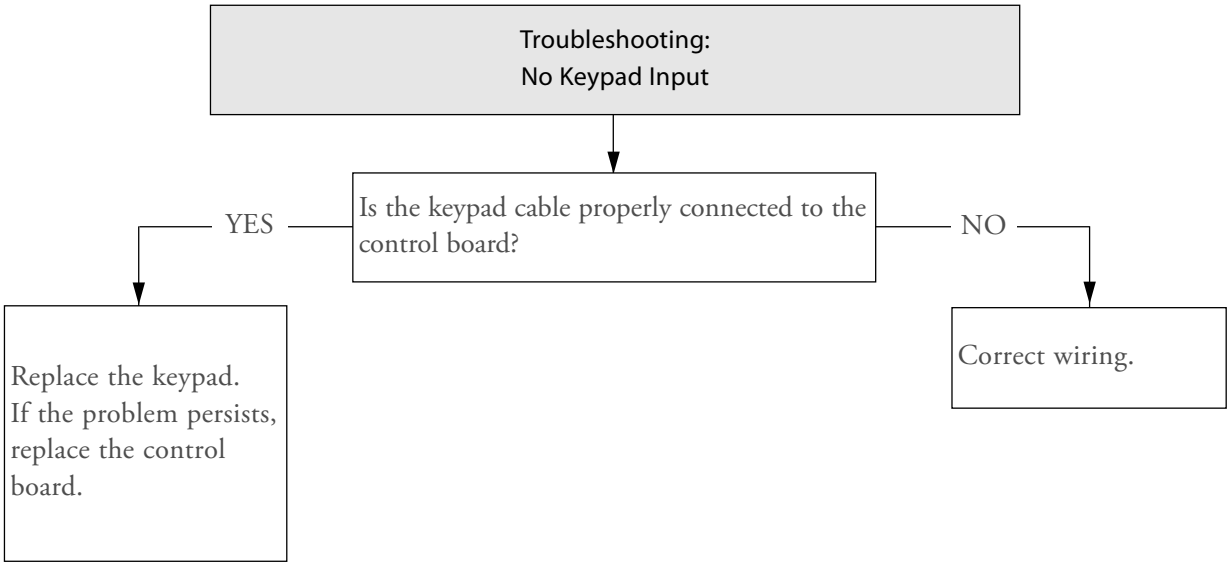

Troubleshooting:
F8: HEAT LOW
Are both blower motors moving air? Check in TEST MODE - see page 16.
YES
NO
Is the high-limit thermostat tripped?
NO
Is the heater defective? Check in TEST MODE - see page 16.
See page 37 to troubleshoot F1: BLOWER (Blower Running Status Bad)
YES
YES
NO
Reset (page 32) and determine why it tripped – excess grease buildup, etc.
Replace defective heater and solid state relay.
Is the solid state relay defective or damaged?
NO
Is the wiring from the solid state relay to the control board OK? (See page 49 for schematic.)
YES
Replace the solid state relay.
YES
NO
Replace the control board.
Correct wiring.

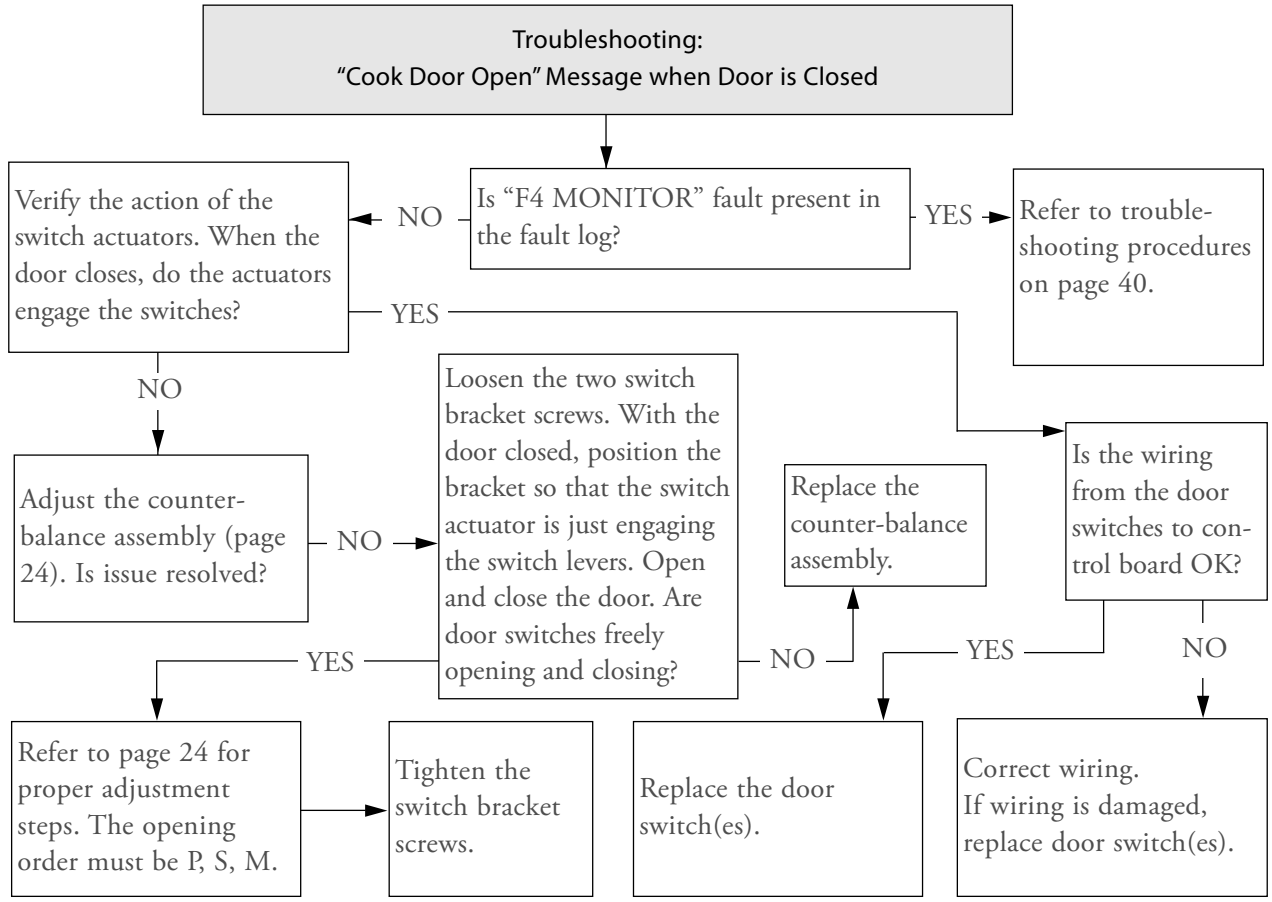
Troubleshooting:
F9: CC TEMP (Cook Cavity Temperature High)

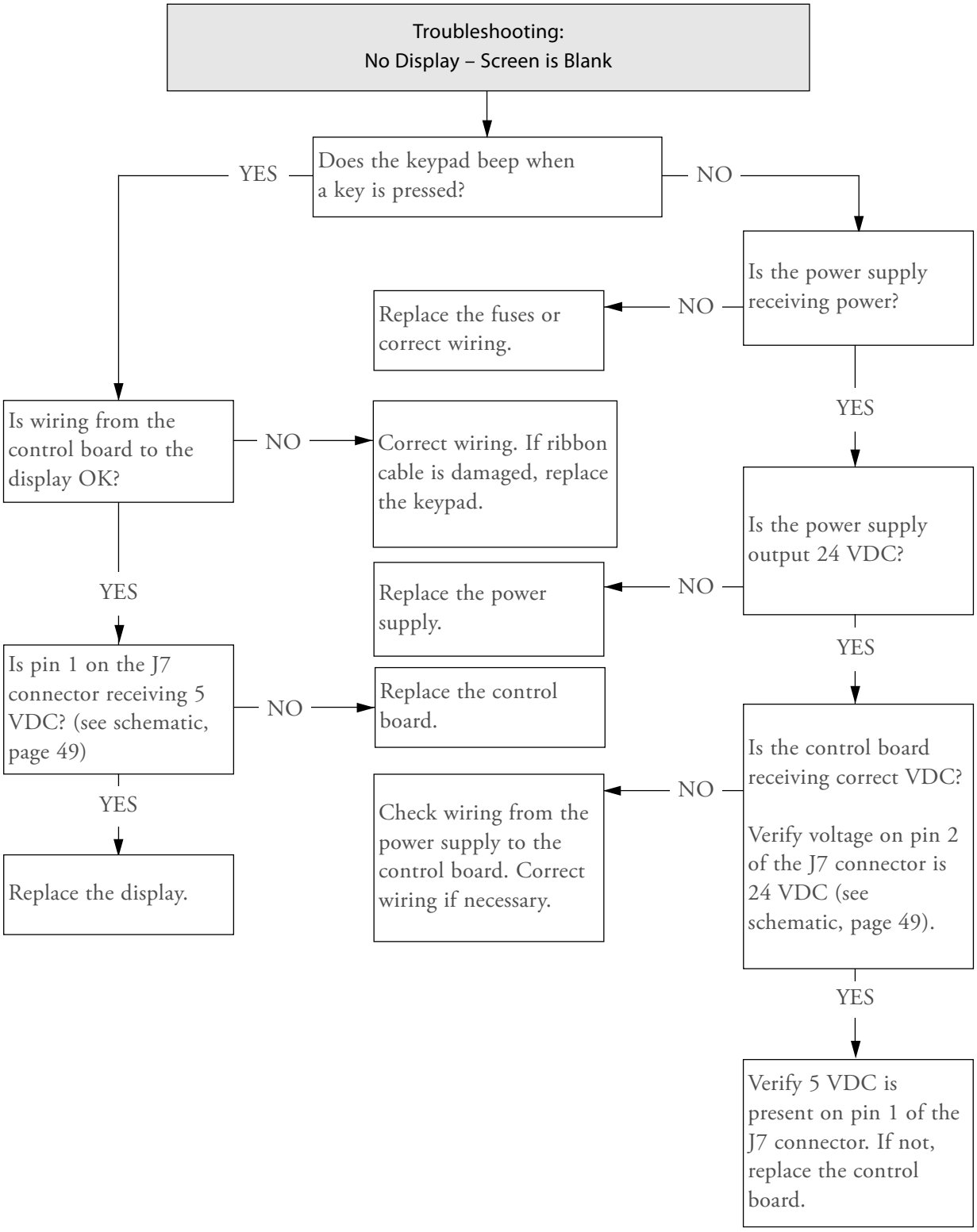
If this fault frequently occurs,
- Ensure the oven is cleaned daily (see pages 7-8).
- Determine if large amounts of grease-laden food are being cooked, and if so, recommend smaller portions per cook cycle.

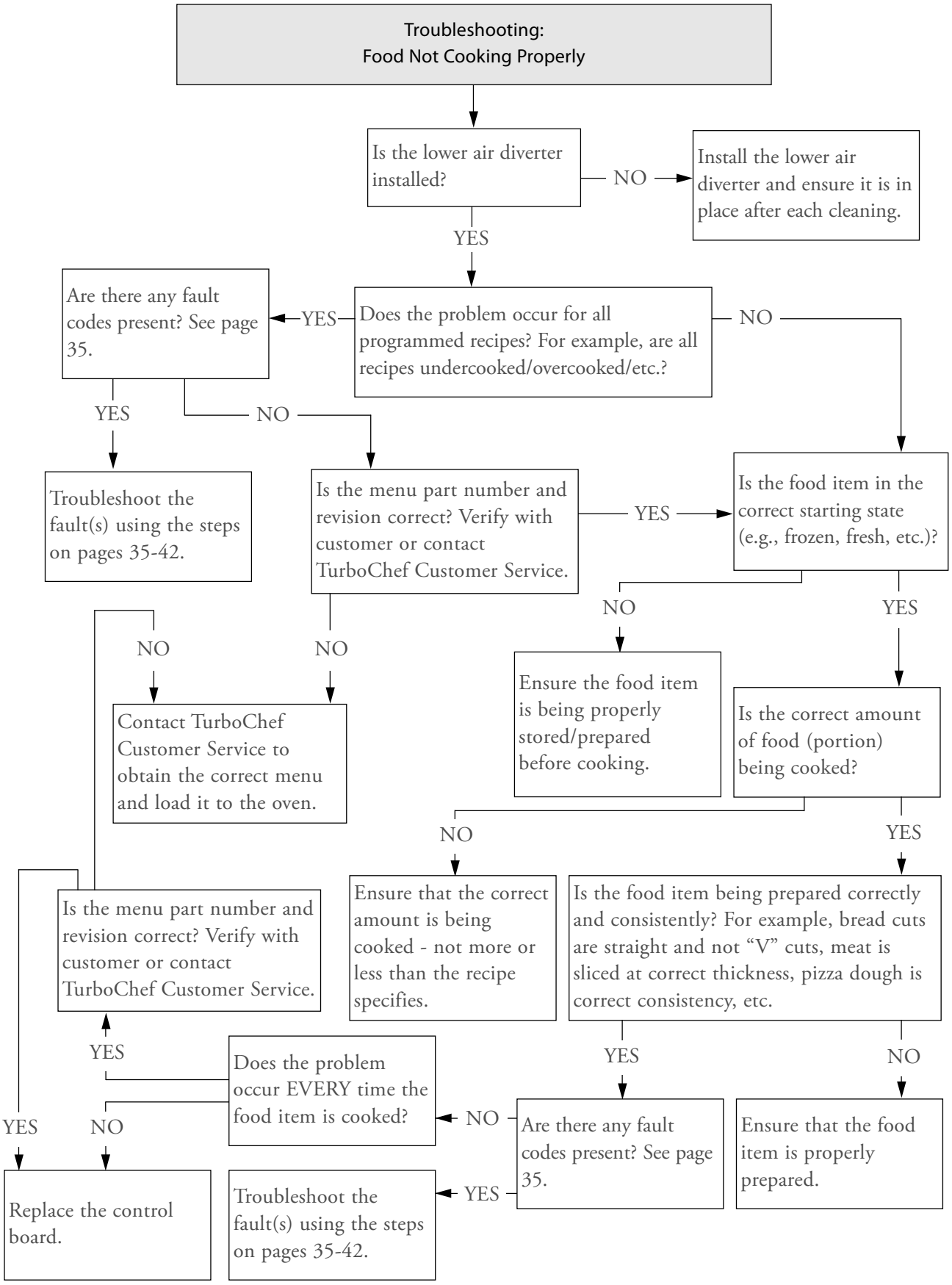
Non-Fault Code Troubleshooting

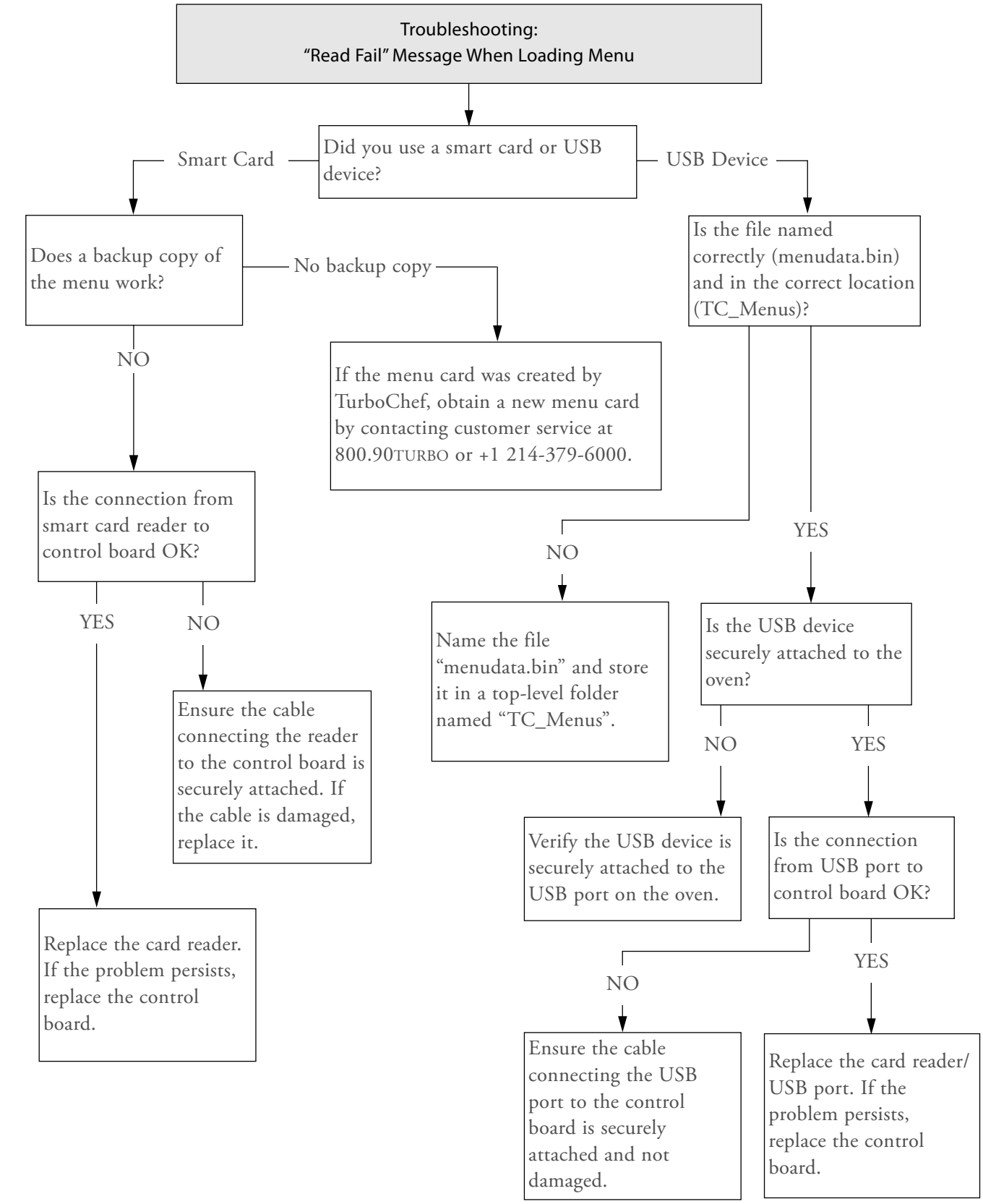
This section provides troubleshooting tips for issues that may occur independently of an oven fault.

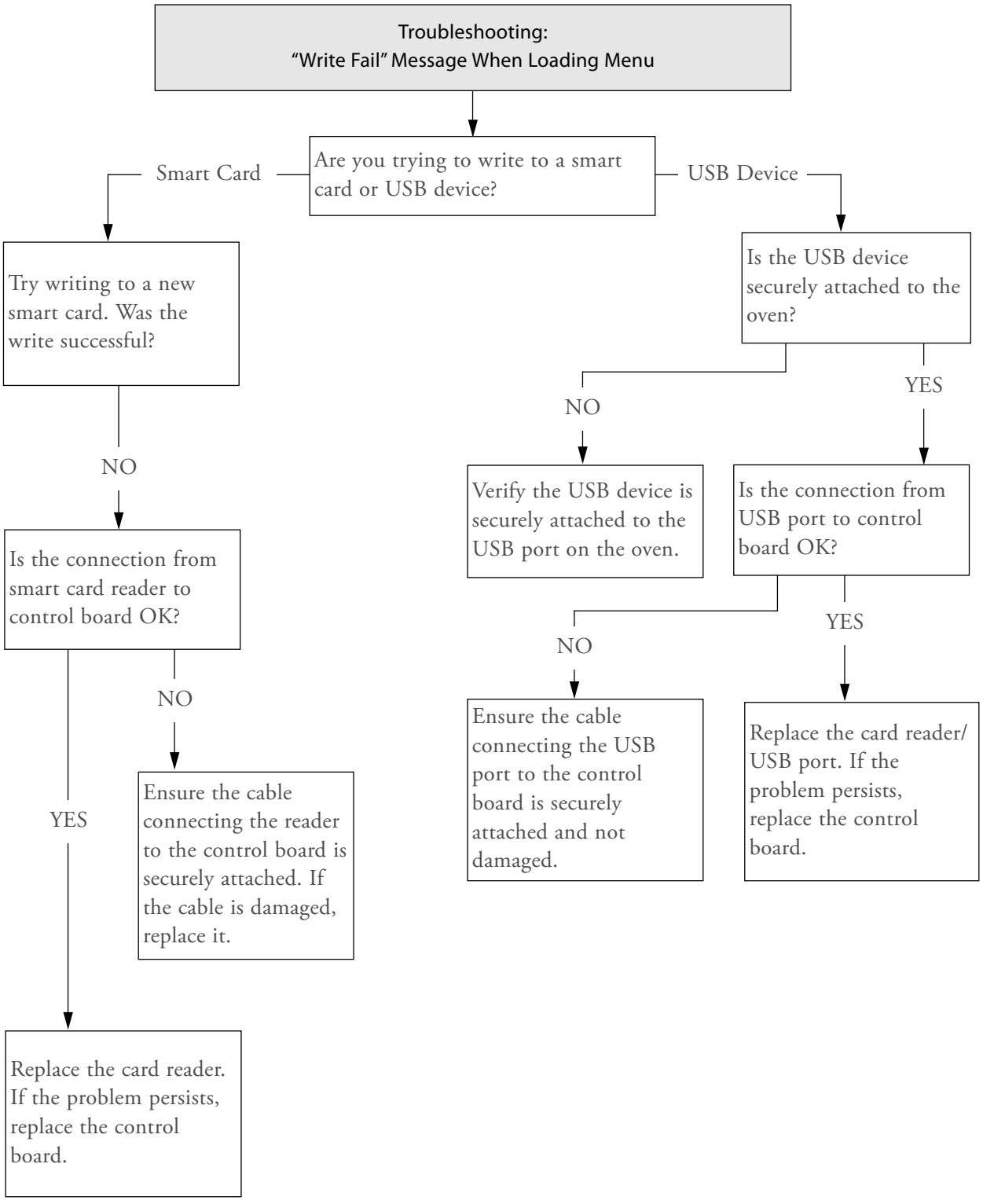

Troubleshooting:
No Keypad Input
Is the keypad cable properly connected to the control board?
YES
NO
Replace the keypad. If the problem persists, replace the control board.
Correct wiring.

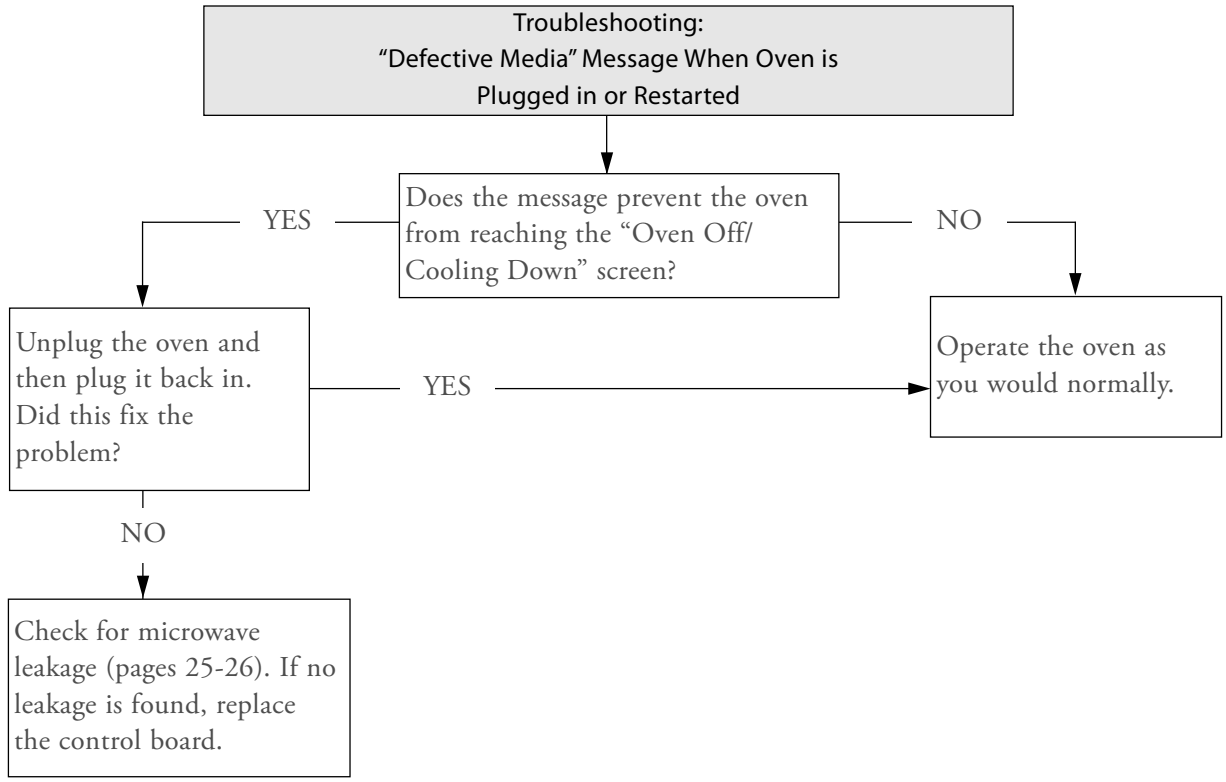

Troubleshooting:
"Cook Door Open" Message when Door is Closed
Is "F4 MONITOR" fault present in the fault log?
NO
YES
Refer to trouble-shooting procedures on page 40.
Verify the action of the switch actuators. When the door closes, do the actuators engage the switches?
YES
NO
Is the wiring from the door switches to control board OK?
Adjust the counter-balance assembly (page 24). Is issue resolved?
NO
Loosen the two switch bracket screws. With the door closed, position the bracket so that the switch actuator is just engaging the switch levers. Open and close the door. Are door switches freely opening and closing?
Replace the counter-balance assembly.
YES
NO
YES
NO
Refer to page 24 for proper adjustment steps. The opening order must be P, S, M.
Tighten the switch bracket screws.
Replace the door switch(es).
Correct wiring.
If wiring is damaged, replace door switch(es).


Troubleshooting:
No Display – Screen is Blank
Does the keypad beep when a key is pressed?
YES
NO
Is the power supply receiving power?
NO
Replace the fuses or correct wiring.
YES
Is the power supply output 24 VDC?
NO
Replace the power supply.
YES
Is the control board receiving correct VDC?
Verify voltage on pin 2 of the J7 connector is 24 VDC (see schematic, page 49).
NO
Check wiring from the power supply to the control board. Correct wiring if necessary.
YES
Verify 5 VDC is present on pin 1 of the J7 connector. If not, replace the control board.
Is wiring from the control board to the display OK?
NO
Correct wiring. If ribbon cable is damaged, replace the keypad.
YES
Is pin 1 on the J7 connector receiving 5 VDC? (see schematic, page 49)
NO
Replace the control board.
YES
Replace the display.


Troubleshooting:
Food Not Cooking Properly
Is the lower air diverter installed?
NO
Install the lower air diverter and ensure it is in place after each cleaning.
YES
Does the problem occur for all programmed recipes? For example, are all recipes undercooked/overcooked/etc.?
YES
Are there any fault codes present? See page 35.
NO
YES
Troubleshoot the fault(s) using the steps on pages 35-42.
NO
Is the menu part number and revision correct? Verify with customer or contact TurboChef Customer Service.
YES
Is the food item in the correct starting state (e.g., frozen, fresh, etc.)?
NO
Contact TurboChef Customer Service to obtain the correct menu and load it to the oven.
NO
Ensure the food item is being properly stored/prepared before cooking.
YES
Is the correct amount of food (portion) being cooked?
NO
Ensure that the correct amount is being cooked - not more or less than the recipe specifies.
YES
Is the food item being prepared correctly and consistently? For example, bread cuts are straight and not "V" cuts, meat is sliced at correct thickness, pizza dough is correct consistency, etc.
YES
Are there any fault codes present? See page 35.
NO
Ensure that the food item is properly prepared.
YES
Troubleshoot the fault(s) using the steps on pages 35-42.
NO
Does the problem occur EVERY time the food item is cooked?
YES
Is the menu part number and revision correct? Verify with customer or contact TurboChef Customer Service.
NO
Replace the control board.


Troubleshooting:
"Read Fail" Message When Loading Menu
Did you use a smart card or USB device?
Smart Card
USB Device
Does a backup copy of the menu work?
No backup copy
If the menu card was created by TurboChef, obtain a new menu card by contacting customer service at 800.90TURBO or +1 214-379-6000.
NO
Is the connection from smart card reader to control board OK?
YES
NO
Ensure the cable connecting the reader to the control board is securely attached. If the cable is damaged, replace it.
Replace the card reader. If the problem persists, replace the control board.
Is the file named correctly (menudata.bin) and in the correct location (TC_Menus)?
NO
YES
Name the file "menudata.bin" and store it in a top-level folder named "TC_Menus".
Is the USB device securely attached to the oven?
NO
YES
Verify the USB device is securely attached to the USB port on the oven.
Is the connection from USB port to control board OK?
NO
YES
Ensure the cable connecting the USB port to the control board is securely attached and not damaged.
Replace the card reader/ USB port. If the problem persists, replace the control board.


Troubleshooting:
"Write Fail" Message When Loading Menu
Are you trying to write to a smart card or USB device?
Smart Card
USB Device
Try writing to a new smart card. Was the write successful?
NO
Is the connection from smart card reader to control board OK?
NO
Ensure the cable connecting the reader to the control board is securely attached. If the cable is damaged, replace it.
YES
Replace the card reader. If the problem persists, replace the control board.
Is the USB device securely attached to the oven?
NO
Verify the USB device is securely attached to the USB port on the oven.
YES
Is the connection from USB port to control board OK?
NO
Ensure the cable connecting the USB port to the control board is securely attached and not damaged.
YES
Replace the card reader/ USB port. If the problem persists, replace the control board.


Troubleshooting:
"Defective Media" Message When Oven is Plugged in or Restarted
Does the message prevent the oven from reaching the "Oven Off/ Cooling Down" screen?
YES
NO
Unplug the oven and then plug it back in. Did this fix the problem?
YES
Operate the oven as you would normally.
NO
Check for microwave leakage (pages 25-26). If no leakage is found, replace the control board.

Oven Schematic

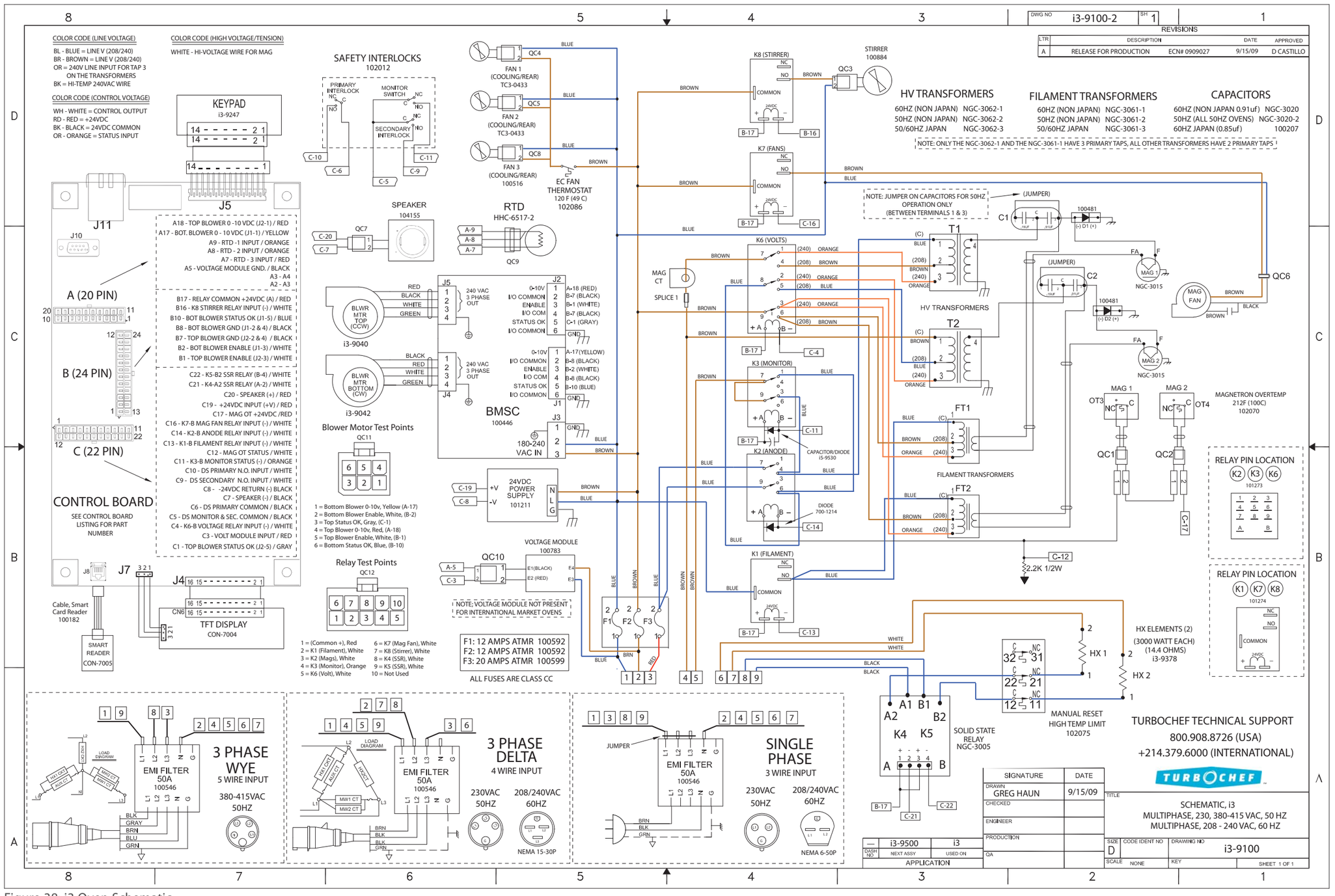


Figure 38: i3 Oven Schematic

This page intentionally left blank.

Appendix - Replacing Oven Components

Replacing Oven Components

This appendix provides illustrations for removing serviceable items, as well as the item numbers and descriptions for those items. It also includes the item numbers and descriptions for the hardware used to secure each component to the oven chassis.

The appendix is divided into the following sections:

- No Cover Removal Required (pages A-2 through A-3)
- Opening Top Cover Required (pages A-4 through A-5)
- Removing Top Cover Required (pages A-5 through A-7)
- Removing Left Side Cover Required (pages A-8 through A-9)
- Removing Right Side Cover Required (page A-10)
- Removing Left and Right Side Covers Required (page A-11)

If you have any questions that are not addressed in this manual or appendix, please contact TurboChef Customer Service at 800-90TURBO or +1 214-379-6000.

No Cover Removal Required (Figures A-1, A-2)

⚠ CAUTION: Before removing/installing any component, make sure the oven has cooled and the screen reads "Oven Off."

Hardware listed is required for installing component to oven.

Figure Reference #	Item Description	Item Part Number	Hardware Description	Hardware Part Number(s)
1	Door Assembly	i3-9308	Screw, #8-32 x 3/8, PFH, 100 Deg, SS	102809 (qty 6)
2	Door Gasket	i3-9309	None	None
3	Door Handle	i3-9253	Screw, 1/4-20 x .25 lg, Serrated Hex	102947 (qty 4)
4	Door Skin	i3-9109	Screw, 6-32 x .38, PFH, 100 Deg, SS	101430 (qty 9)
5	Drain Pan	i3-9252	None	None
N/A	EMI Filter*	100546	Screw, M5 x 8, PPHD, Sems, SS	101707 (qty 4)
N/A	EMI Filter Bracket*	i3-9389	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4)
N/A	EMI Filter Cover*	i3-9390	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4)
6	Filter, Air	i3-9039	None	None
7	Filter Bracket	i3-9060	A) Screw, Sh Mtl #8 x 1/2, Serrated PHTRH B) Plug, Knockout, 1/2", Black	A) 101688 (qty 6) B) 101191 (qty 1)
8	Hand Grip (qty 4)	i5-9256	Screw, #8 X 1/2, Serrated, PHTRH, Black Oxide	101691 (qty 2) each
9	Jetplate, Bottom	i3-9160	Screws and Mounting Clips, Fast Lead	i5-3201
10	Jetplate, Top, Ceramic†	i5-3204	None	None
11	Jetplate, Top, Insert†	i3-9427	None	None
12	Jetplate, Top, Metal†	i3-9425	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 10)
13	Lower Front Panel	i3-9246	None	None
14	Rack	i3-9167	None	None
15	Shunt Plate Assembly	i3-9307	Screw, 6-32 x .38, PFH, 100 Deg, SS	101430 (qty 9)
16	Stirrer, Metal†	i3-9428	A) Screw, #10-32 x 1/2, PPH, SS B) Washer, Lock, #10 Ext Tooth, Cres	A) 101460 (qty 1) B) 102260 (qty 1)
17	Stirrer, Mica†	i5-9154	A) Screw, #10-32 x 1/2, PPH, SS B) Washer, Lock, #10 Ext Tooth, Cres	A) 101460 (qty 1) B) 102260 (qty 1)
18	Vent Catalyst Foil Pack	RWD-9191	None	None
19	Vent Tube Cover	NGC-1392	Screw, #6 x 3/8, PPHD, Drill Point, Zinc	101684 (qty 2)
20	Weldment, Heat Chnl, Vent Tube	NGC-1397	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 6)

* Detail on page A-9.

† The i3 utilizes two versions of the top jetplate. Ovens with serial numbers between 00001 and 01000 use the ceramic top jetplate. All i3 ovens with serial number 01001 and greater use the metal top jetplate that includes the glass jetplate insert.

NOTE: The installation of items 10, 11, 12, 16, and 17 will vary based on the oven's serial number. See the parts list on page A-2 for more information.

NOTE: Item 14 attached to bottom jetplate upon installation.

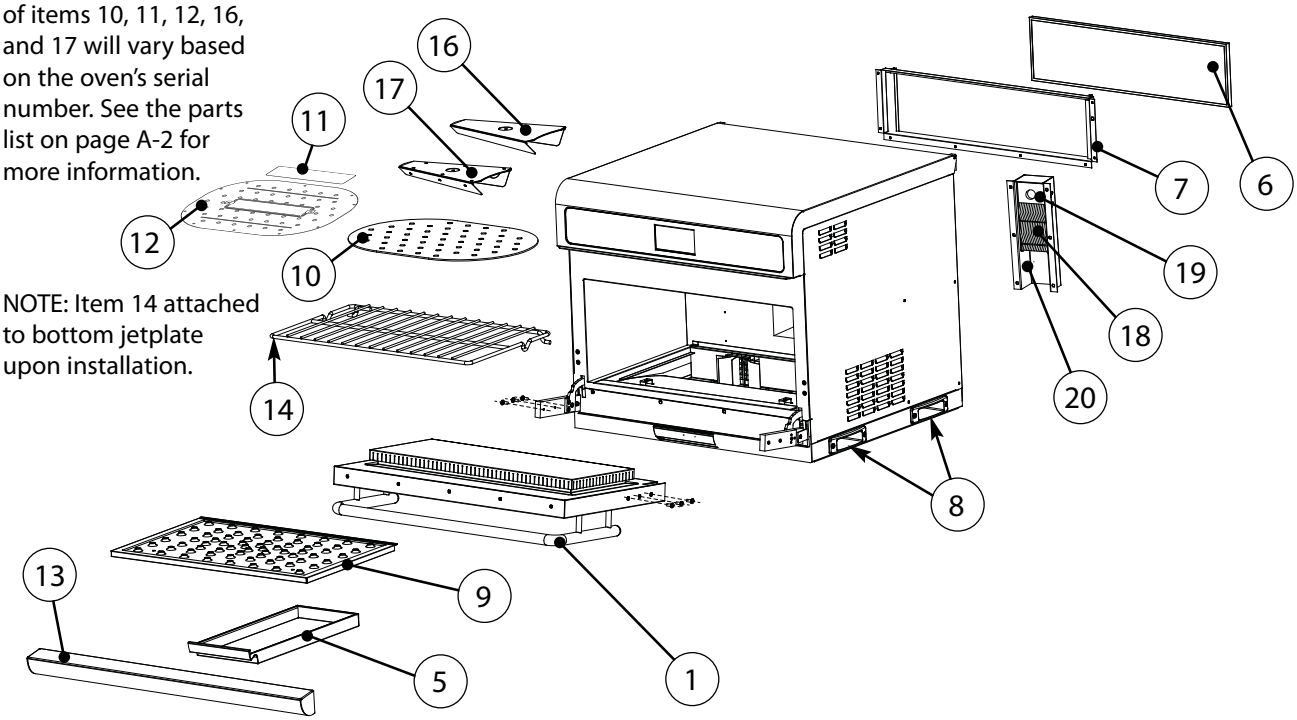


Figure A-1: No Cover Removal Required

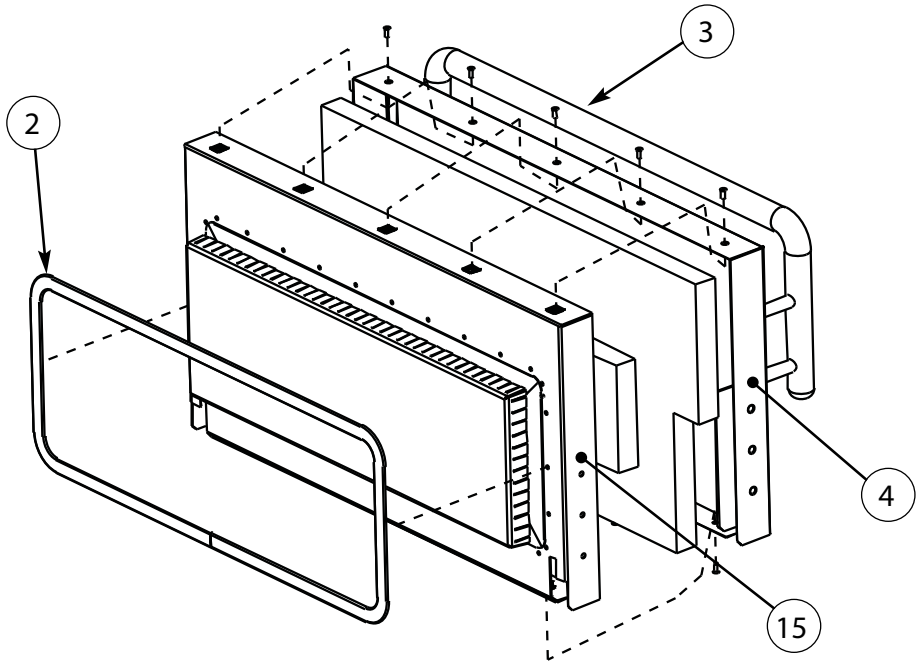


Figure A-2: Door Assembly Detail

Opening Top Cover Required (Figure A-3)

⚠ CAUTION: Before removing/installing any component, make sure it is disconnected from the wire harness (where applicable).

NOTE: Hardware listed is required for installing component to oven.

To open the top cover:

1. Open the oven door.
2. Remove the two screws that secure the top cover to the heat shield (above the oven door).
3. Open the top cover.
4. Secure the support arm in place.

Figure Reference #	Item Description	Item Part Number	Hardware Description	Hardware Part Number(s)
1	Capacitor and Diode, Monitor Relay	i5-9390	None	None
N/A	Cover, Top	i3-9243	Screw, #10-32 x 3/8 lg, PFLH, 100 Deg, SS	101401 (qty 2)
2	Fuse, F1, 12-amp	100592	None	None
3	Fuse, F2, 12-amp	100592	None	None
4	Fuse, F3, 20-amp	100599	None	None
5	Fuse Holder	103566	Screw, #8-32 x 3/8, PPHD, Int Sems, SS	102921 (qty 4)
N/A	Heat Shield/Support Bracket*	i3-9224	Screw, Torx Head, Sh Mtl, 3/8, Cres	102752 (qty 2)
N/A	Keypad*	i3-9247	None	None
6	Power Supply	101211	Screw, M3 x 8mm, Sems, PPHD, Cres	103444 (qty 3)
7	Relay (K1 - Filament)	101274	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
8	Relay (K2 - Anode)	101273	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
9	Relay (K3 - Monitor)	101273	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
10	Relay (K6 - Voltage)	101272	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
11	Relay (K7 - Mag Fan)	101274	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
12	Relay (K8 - Stirrer)	101274	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
13	Relay, Solid State (K4/K5 - Heaters)	101286	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 2)
N/A	Thermostat, Cooling Fans*	102086	Screw, #6 x 1/2, PPHD, Drill Point, SS	101687 (qty 2)
14	Voltage Sensor	100783	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 1)

* Detail on page A-7.

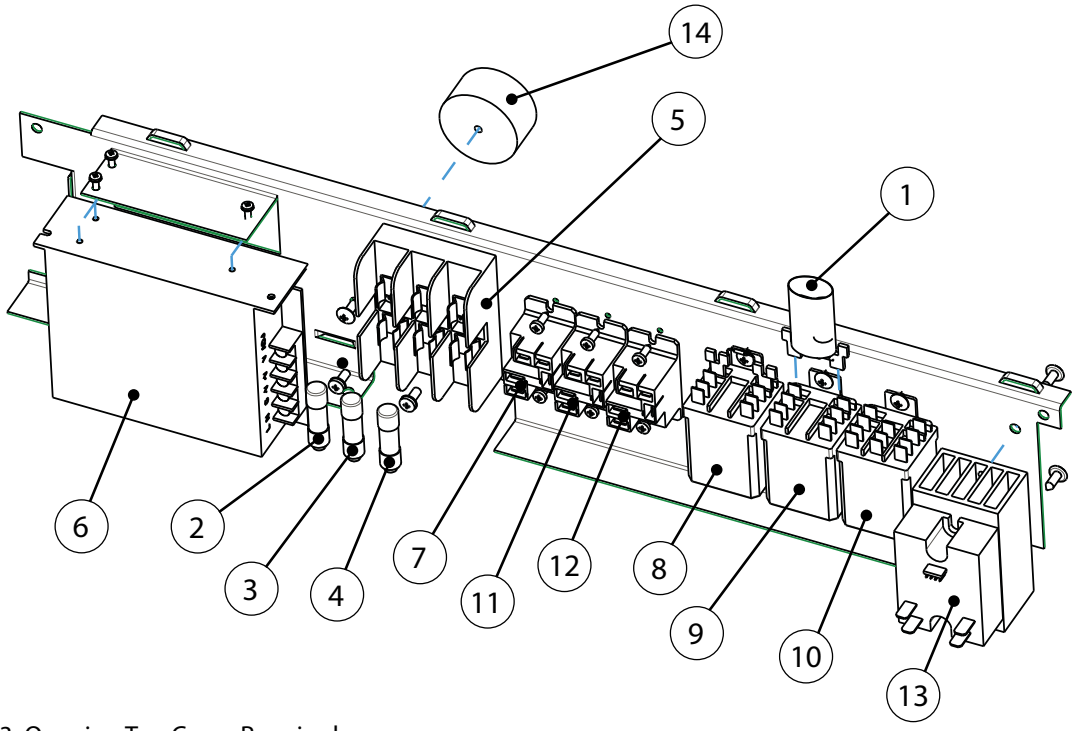


Figure A-3: Opening Top Cover Required

Removing Top Cover Required (Figures A-4, A-5, A-6)

DANGER: Before replacing any microwave circuit component, ensure the oven is removed from power source. Replacing a component while the oven is in operation can result in serious injury or death.

CAUTION: Before removing/installing any component, make sure it is disconnected from the wire harness (where applicable).

Hardware listed is required for installing component to oven.

To remove the top cover:

1. Open the top cover (see page A-4 for details).
2. Remove the hinge screws located near the back of each side of the top cover.
3. Detach the support braces from the oven frame. (They should remain attached to the top panel.)

CAUTION: When detaching the support braces, be sure to support the top cover to prevent it from collapsing onto the components in the electrical compartment.

4. Remove the top panel and place it where it will not be damaged.

CAUTION: The top cover has critical components attached. Handle it carefully.

Figure Reference #	Item Description	Item Part Number	Hardware Description	Hardware Part Number(s)
1	Capacitor, High-Voltage (x2)	100232	None	None
2	Capacitor, Magnetron Fan	100242	A) Washer, Split Lock, 3/8 B) Nut, Hex, M8, Cres	A) 102340 B) 101057
3	Capacitor Clamps (x2)	100134	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 2) each
4	Control Board	CON-3001	Nut, Keps, Hex, #6-32, Ext Tooth, Cres	102961 (qty 4)
5	Cooling Fan, Exterior (x2)	TC3-0433	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 2) each
6	Cooling Fan, Interior	100516	Screw, #8-32 x 2" Lg, PPHD, SS	101659 (qty 2)
7	Cooling Fan Finger Guard (x2)	100086	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 2) each
8	Cooling Fan, Magnetron	100091	Screw, M4 x 6, PPH SQ CO Sems, Zinc	101672 (qty 4)
9	Cooling Fan Ring, Magnetron	100092	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4)
10	Diode, High-Voltage (x2)	100481	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 2) each
11	Display, TFT	i5-3207	Nut, Keps, Hex, #4-40, Ext Tooth	102960 (qty 4)
12	Magnetron (Left)	NGC-3015	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4)
13	Magnetron (Right)	NGC-3015	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4)
14	Motor Controller	100446	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4)
15	Smart Card/USB Port	CON-7005	A) Standoff, Round, .12 ID, .25 OD x .375" B) Nut, Keps, Hex, #4-40, Ext Tooth	A) 101923 (qty 4) B) 102960 (qty 4)
16	Stirrer Coupling Spider Insert	104134	None	None
17	Stirrer Hub (x2)	104132	Set Screw (Provided)	N/A
18	Stirrer Motor	100884	Screw, M4 x 6, PPH SQ CO Sems, Zinc	101672 (qty 2)
19	Stirrer Motor Bracket	i5-9075	Screw, M4 x 6, PPH SQ CO Sems, Zinc	101672 (qty 2)
20	Stirrer Shaft*	i5-9151 / i3-9151*	None	None
21	Stirrer Shaft, Support	i5-9152	None	None
22	Thermostat, Magnetron (Left)	102070	Screw, Sh Mtl, Drill Point, 6-32 x 3/8, PPHD, Zinc	101684 (qty 2)
23	Thermostat, Magnetron (Right)	102070	Screw, Sh Mtl, Drill Point, 6-32 x 3/8, PPHD, Zinc	101684 (qty 2)
24	Transformer, Filament (x2)	NGC-3061-1	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4) each
25	Transformer, High-Voltage (x2)	NGC-3062-1	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 4) each
N/A	Waveguide (Left)	i5-3210	Nut, Keps, Hex, #10-32, Ext Tooth, Cres	102963 (qty 9)
N/A	Waveguide (Right)	i5-3210	Nut, Keps, Hex, #10-32, Ext Tooth, Cres	102963 (qty 9)
N/A	Waveguide Gasket (Left)	i5-9331	None	None
N/A	Waveguide Gasket (Right)	i5-9331	None	None

* The i3 utilizes two versions of the stirrer shaft. Ovens with serial numbers between 00001 and 01000 must use i5-9151. All i3 ovens with a serial number of 01001 or greater use i3-9151.

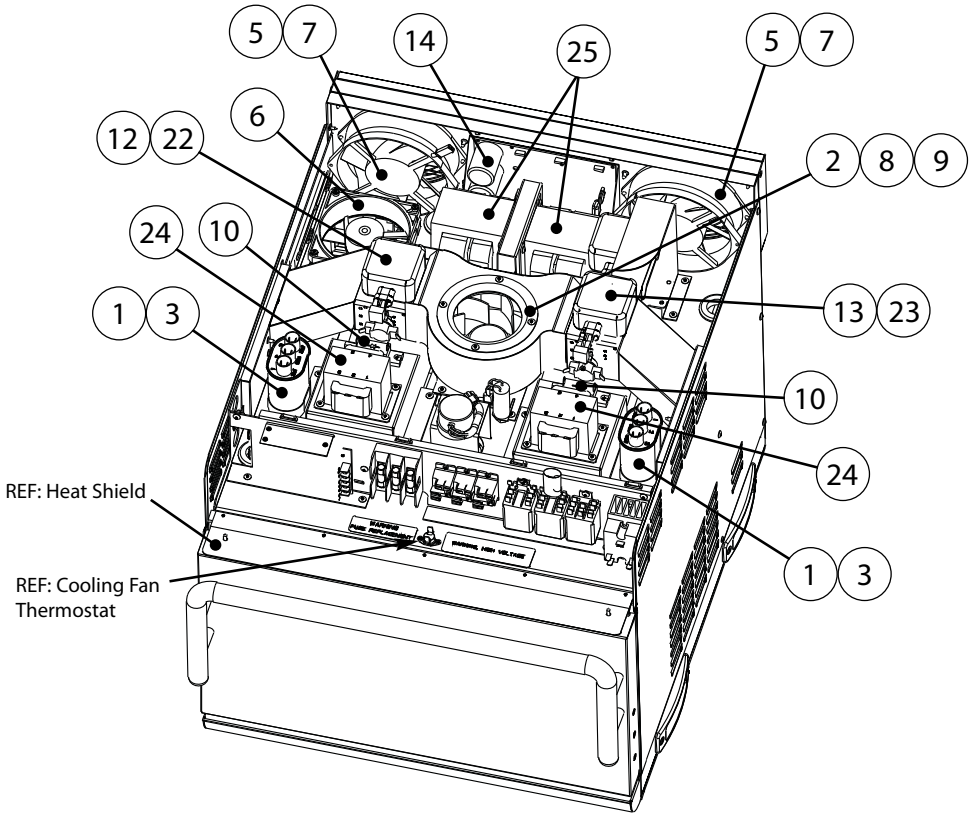


Figure A-4: Removing Top Cover Required

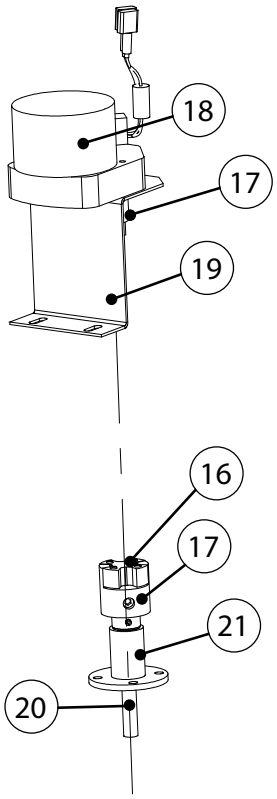


Figure A-5: Stirrer Motor and Assembly Detail

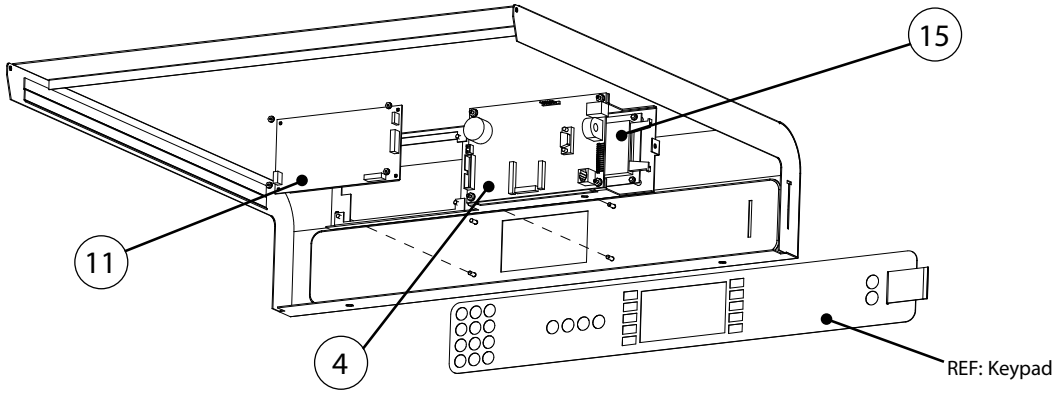


Figure A-6: Top Cover Detail

Removing Left Side Cover Required (Figures A-7, A-8)

⚠ CAUTION: Before removing/installing any component, make sure it is disconnected from the wire harness (where applicable).

⚠ CAUTION: Be careful to not tear the insulation when servicing components. Always reset the insulation properly before reinstalling the side panel.

Hardware listed is required for installing component to oven.

To remove the left side cover, remove the screws securing the panel to the oven frame. To re-install the left side cover, you may need to open the top cover (see page A-4 for details).

Figure Reference #	Item Description	Item Part Number	Hardware Description	Hardware Part Number(s)
1	Blower Motor (top)	i5-9220	Nut, 1/4 - 20, Serr Hex Flange, Plated	100906 (qty 4)
2	Blower Motor (bottom)	i5-9221	Nut, 1/4 - 20, Serr Hex Flange, Plated	100906 (qty 4)
3	Blower Wheel (top)	104107	None	None
4	Blower Wheel (bottom)	104108	None	None
N/A	Cover, Left Side	i3-9301	Screw, #8 Serr, PHD Truss, Black Oxide	101691 (qty 5)
5	Heat Slinger	102708	None	None
6	Helper Spring, Interlock Switch*	i5-9397	None	None
7	Interlock Switch, Primary*	102012	Screw, #4-40 x 1", PPH, Sems	102903 (qty 2)
8	Mounting Bracket, Interlock Switch*	i5-9272	Screw, #10-32 x 3/4 lg, PPH Sems, Int Th	102937 (qty 2)
N/A	Power Cord	i5-9127	None	None

* NOTE: For more interlock switch detail, see Figure A-10, page A-11.

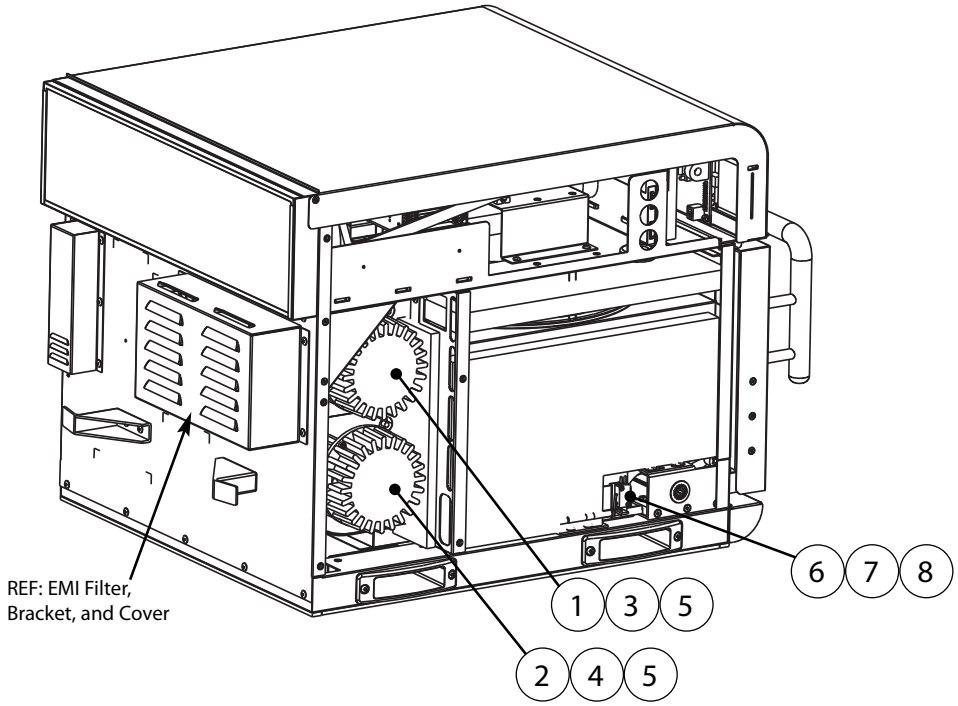


Figure A-7: Removing Left Side Cover Required

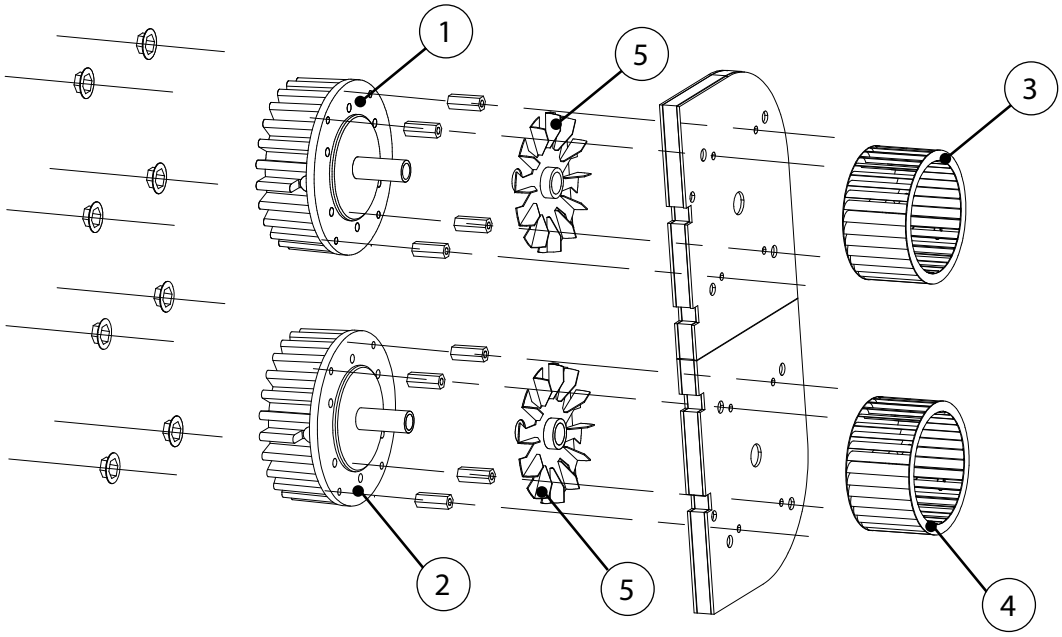


Figure A-8: Blower Motor Assembly

Removing Right Side Cover Required (Figure A-9)

⚠ CAUTION: Before removing/installing any component, make sure it is disconnected from the wire harness (where applicable).

⚠ CAUTION: Be careful to not tear the insulation when servicing components. Always reset the insulation properly before reinstalling the side panel.

Hardware listed is required for installing component to oven.

To remove the right side cover:

1. Remove the screws securing the panel to the oven frame.
2. Remove the right side cover.

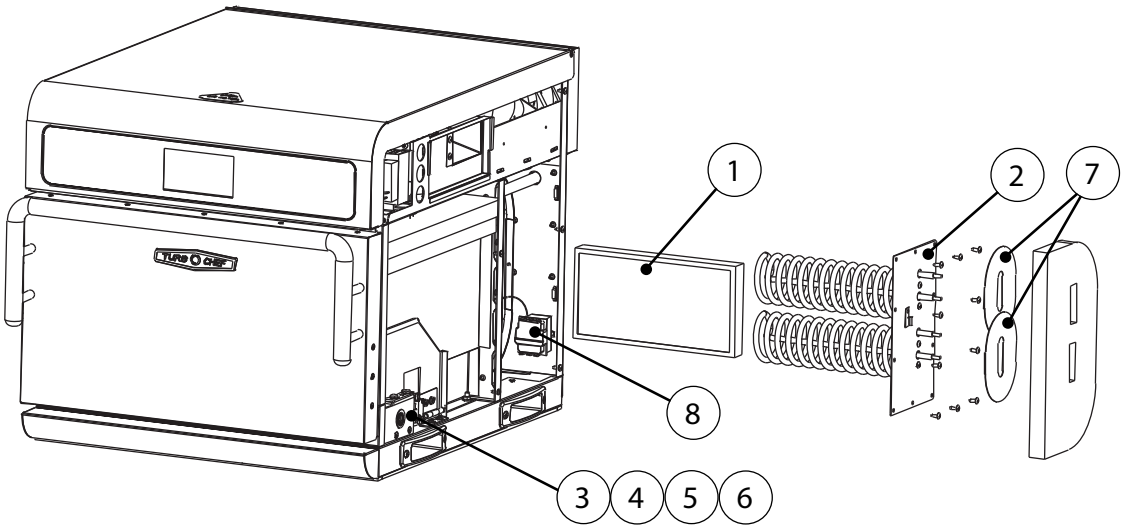


Figure A-9: Removing Right Side Cover Required

Figure Reference #	Item Description	Item Part Number	Hardware Description	Hardware Part Number(s)
1	Catalytic Converter	i3-9066	None	None
N/A	Cover, Right Side	i3-9302	Screw, #8, Serr PPHD, Truss, Black Oxide	101691 (qty 5)
2	Heater Assembly	i3-9380	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 10)
3	Helper Spring, Interlock Switch*	i5-9397	None	None
4	Interlock Switch - Monitor*	102012	Screw, #4-40 x 1", PPH, Sems	102903 (qty 2)
5	Interlock Switch - Secondary*	102012	Screw, #4-40 x 1", PPH, Sems	102903 (qty 2)
6	Mounting Bracket, Interlock Switch*	i5-9272	Screw, #10-32 x 3/4 lg, PPH Sems, Int Th	102937 (qty 2)
N/A	RTD, Cook Cavity	HHC-6517-2	Screw, Sh Mtl #8 x 1/2, Serrated PHTRH	101688 (qty 2)
7	Shield, Heater Insulation (x2)	i5-9216	None	None
8	Thermostat, High-Limit	102075	Screw, M4 x 6, PPH SQ CO Sems, Zinc	101672 (qty 2)

* NOTE: For more interlock switch detail, see Figure A-10, page A-11.

Removing Right and Left Covers Required (Figure A-10)

⚠ CAUTION: Before removing/installing any component, make sure the oven has cooled and the screen reads "Oven Off."

Hardware listed is required for installing component to oven.

Figure Reference #	Item Description	Item Part Number	Hardware Description	Hardware Part Number(s)
1	Hinge, Bracket, Slide, LHS	i5-9196	Nut, Keps, Hex, #8-32, Ext Tooth, Cres	102962 (qty 4)
2	Hinge, Bracket, Slide, RHS	i5-9195	Nut, Keps, Hex, #8-32, Ext Tooth, Cres	102962 (qty 4)
3	Hinge, Cam, Weldment, LHS	i5-9313	Washer, Nylon, Hingepin	C0504 (qty 1)
4	Hinge, Cam, Weldment, RHS	i5-9314	Washer, Nylon, Hingepin	C0504 (qty 1)
5	Hinge, Guide Block, Top	i5-9394	Nut, Keps, Hex, #8-32, Ext Tooth, Cres	102962 (qty 4)
6	Hinge, Guide Block, Bottom	i5-9393	None	None
7	Hinge, Gusset, LHS	i5-9178	Nut, 1/4 - 20, Serr, Hex Flange, Plated Steel	100906 (qty 2)
8	Hinge, Gusset, RHS	i5-9179	Nut, 1/4 - 20, Serr, Hex Flange, Plated Steel	100906 (qty 2)
9	Hinge Module, Base	i3-9193	None	None
10	Hinge, Torsion Bar	i3-9144	Spacer, Adjustment	Call TurboChef
11	Hinge, Weldmt, Ctrblnce Brkt, LHS	i5-9326	Screw, 10-32 x 3/8 lg, PFLH, 100 Deg, SS	101401 (qty 3)
12	Hinge, Weldmt, Ctrblnce Brkt, RHS	i5-9327	Screw, 10-32 x 3/8 lg, PFLH, 100 Deg, SS	101401 (qty 3)

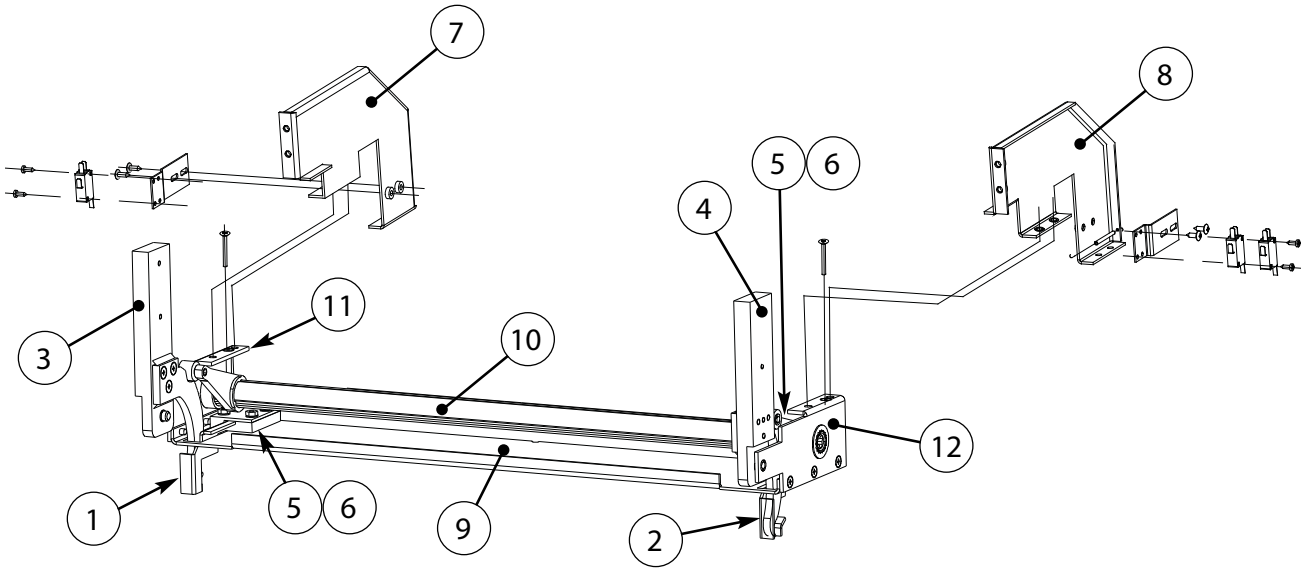


Figure A-10: Counter Balance Assembly, Hinge, and Switch Detail

For service or information:

WITHIN NORTH AMERICA CALL

Customer Service *at* 1-800-90TURBO

OUTSIDE NORTH AMERICA CALL

+1 214-379-6000 or Your Authorized Distributor

TURBOCHEF™

Part Number: i3-9231 / Revision B / April 2010
Country Code: NA/EU

Global Operations

4240 International Pkwy, Suite 105
Carrollton, Texas 75007 USA
+1 214-379-6000 PHONE
+1 214-379-6073 FAX

turbochef.com